Haynes Guide
The Complete Handbook
REVISED EDITION
APPROVED BY THE NATIONAL PARK SERVICE
Yellowstone National Park

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HAYNES NEW GUIDE

AND

MOTORISTS' COMPLETE ROAD LOG OF YELLOWSTONE NATIONAL PARK

By

J. E. Haynes, B. A.
Official Photographer of Yellowstone National Park

Revised Edition Approved by The National Park Service

Thirty-fifth Edition

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100 Illustrations
Maps and Diagrams

J. E. Haynes, Publisher
Saint Paul

POWERFUL, GENTLE, UNAFRAID 16348

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By F. Jay Haynes

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To the Peoples of the World:

THE National Park Service, of the United States Department of the Interior, in which the administration of all National Parks of America is vested, welcomes you to Yellowstone National Park. It welcomes you to the fullest use of its roads, trails and paths; to its public automobile camp grounds, hotels and permanent camps. It invites you to profit by its recreational facilities, to study its scientific and historical features, to explore its game-trailed wilderness, to climb its mountain peaks, to fish its streams and lakes; to see its great laboratory of geysers, springs, terraces, fumaroles; its bold ruins of great volcanic flows; its silent hills of glacial drift; its forests, flowers and fauna. It offers you the opportunity to feel and understand its greatness, its beauty, its infinite diversity. Finally, the Service asks, in the interest of posterity, your aid and co-operation in preserving intact, without blot or scar, all features of the world's greatest museum of natural history—Yellowstone National Park.

Horace M. Albright

Superintendent of Yellowstone National Park.

OLD FAITHFUL GEYSER AT SUNRISE, 120-170 FEET 10160

PREFACE.

THE purpose of this book is to point out, describe, and picture all of the places of interest reached by way of the highways, side roads and trails of Yellowstone National Park; and to supply the scientific and historical information necessary to a clear understanding and appreciation of them.

As an authentic and complete reference book of the park it has gained a permanent place in Yellowstone literature having been officially approved by the National Park Service.

To visitors who are unfamiliar with the park this handbook is of value in directing their attention to the interesting features which otherwise they might unknowingly pass.

The complete Road Log for motorists is accurate and as concise as possible, without sacrificing thoroughness. It is illustrated by detail maps of the principal groups of features, the foot paths and habitations.

To the following authorities, for their generous and invaluable assistance in the preparation of this book, grateful appreciation is acknowledged:

Mr. Horace M. Albright, park superintendent, Dr. and Mrs. Edmund Heller, Mr. Emerson Hough, Frank E. A. Thone, Ph.D., and Mr. Olin D. Wheeler. The text has been thoroughly checked by Mr. Albright. Dr. and Mrs. Heller contributed the chapter on Animals. Mr. Hough prepared the description of Grasshopper Glacier. Dr. Thone contributed the chapters on flowers and trees. Mr. Wheeler wrote the articles about John Colter, James Bridger and Warren A. Ferris.

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YELLOWSTONE NATIONAL PARK

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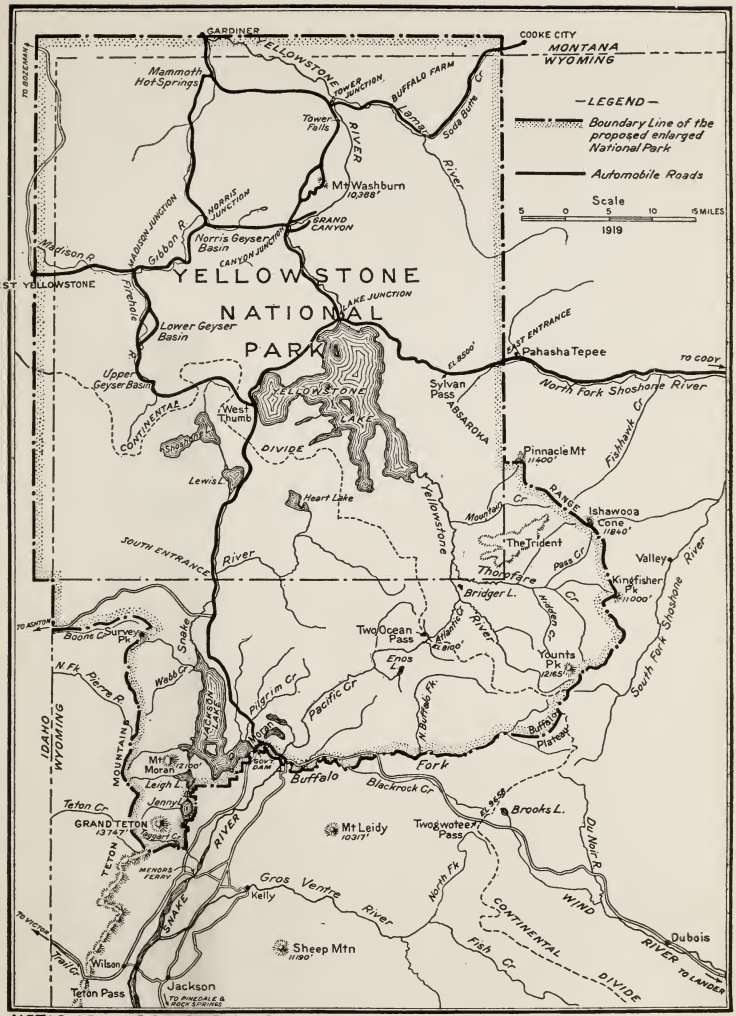
OUT WHERE THE WEST BEGINS

By Arthur Chapman

Out where the handclasp's a little stronger,
Out where the smile dwells a little longer,
That's where the West begins;
Out where the sun is a little brighter,
Where the snows that fall are a trifle whiter,
And the bonds of home are a wee bit tighter,
That's where the West begins.

Out where the skies are a little bluer,
Out where friendship's a little truer,
That's where the West begins;
Out where a fresher breeze is blowing,
Where there's laughter in every streamlet flowing,
Where there's more of reaping and less of sowing,
That's where the West begins.

Out where the world is in the making,
Where fewer hearts grow weary with aching,
That's where the West begins;
Where there's more of singing and less of sighing,
Where there's more of giving and less of vieing,
And a man makes friends without half trying—
That's where the West begins.



NATIONAL PARK SERVICE.

YELLOWSTONE NATIONAL PARK 18012

PARK PANORAMA—DRAWN BY J. E. HAYNES

YELLOWSTONE NATIONAL PARK

The Yellowstone Park, created March first, 1872, by act of Congress, was one of the first national parks in the United States, reserved from settlement, so that the natural wonders contained therein would be preserved for all time from mutilation of any kind.

The only evidences of civilization are the splendid highways, the system of trails reaching out into the less accessible places, hotels, camps, shops and a few other buildings, made necessary in caring for the wants of travelers.

It has been stated that 100 feet from any road or trail, one finds a wilderness in the same virgin state in which the explorers of the famous expedition of 1870 found it.

The boundaries of the park embrace an area of more than 3,000 square miles, in which are the great terraces, which eclipse those in New Zealand, more and greater geysers than are found in Iceland, and all the rest of the world combined, and canyons whose volcanic sides, by decomposition of their minerals, have taken on the most brilliant and beautifully blended colors.

The park plateau averaging more than 8,000 feet elevation, on all sides is surrounded by mountains, waterfalls and cascades. In the heart of this plateau is Yellowstone Lake, 20 or more miles in length, which at its elevation, has but one rival in size in the western hemisphere, Lake Titicaca, in the Peruvian Andes.

In this area, in their native state, are found great numbers of wild animals, which, free from molestation, have become comparatively fearless. Among the larger animals are the grizzly and black bears, the buffalo or American bison, moose and American elk. The National Park Service officials estimate that here there are between 10,000 and 20,000 elk. In the high mountain places are found the big horn mountain sheep, while lower down in the valleys in certain seasons, one may see the deer and antelope.

MR. HORACE M. ALBRIGHT, SUPERINTENDENT OF THE PARK 20141

Fishing in the lakes and streams is permitted under certain regulations, but no hunting of any kind is permitted. In the lakes, mackinaw trout have been caught weighing nearly 20 pounds, while in the rivers and streams are the native or cutthroat, loch leven, brown, eastern brook, rainbow, and other smaller varieties of trout, as well as grayling and whitefish.

The administration of the park is vested in the National Park Service, Department of the Interior, and the superintendent's office is at Mammoth Hot Springs. Throughout the park, however, are many ranger stations, some of them almost inaccessible, but situated at strategic points, for protecting this vast property, and for keeping animal-hunting poachers away.

Mr. Horace M. Albright, formerly Assistant Director of the National Park Service, who for many years has

been identified with the administration of all the national parks, took office as Superintendent of the park June 28, 1919. Mr. Leroy Hill and Mr. Chester A. Lindsley, who have long been identified with the administration of the Yellowstone, are Assistant Superintendents.

The government regulations are most reasonable, and are made simply for the protection of the park and its visitors.

At Mammoth Hot Springs, Upper Geyser Basin, Yellowstone Lake and the Grand Canyon are the four large hotels, operated by the Yellowstone Park Hotel Company.

The Yellowstone Park Camps Company operates permanent camps at Mammoth Hot Springs, Upper Geyser Basin, Yellowstone Lake, Grand Canyon and near Tower Fall. All of the hotels and camps have the daily service of the automobile transportation line; and at these various places one may obtain saddle horses and guides for making the local side trips from each point.

SUPERINTENDENT'S OFFICE, MAMMOTH HOT SPRINGS 19005

All the usual requirements of the traveler are supplied at the hotels, camps, stores and picture shops in the park, all of which are operated by private companies under government leases and under supervision of the National Park Service.

A system of automobiles of the Yellowstone Park Transportation Company operates from all entrances to every point, in the park. The independent motorist and the motorcycle rider are permitted on all roads of the park and have all the rights and privileges accorded to visitors using any other means of transportation. Some travelers go through the park with camp wagons, others on horseback in pack train outfits, while hikers, though few in number, are also enthusiastic about their trips. One may tour the park with one's own vehicle and camp outfit, and camp at any of the hundreds of places, and stay any length of time.

The Northern Pacific Railway reaches the Northern boundary at Gardiner, Montana; the Union Pacific System, the Western boundary at West Yellowstone, Montana; the Burlington Route goes to Cody, Wyoming, 55.2 miles east of the Eastern boundary; and the Chicago & North Western Railway goes to Lander, Wyoming, 178.4 miles southeast of the Southern boundary. From these four points the park proper is easily accessible by splendid automobile highways, that from Lander having been opened in 1921 and traversing the famous Jackson Hole country, which is also reached by highways, from Rock Springs and Jackson, Wyoming, and from Victor, Idaho.

Between Yellowstone, Glacier, Rocky Mountain and Mesa Verde and other National Parks, and throughout the West, automobile routes are being improved rapidly to meet the phenomenal increase in automobile travel.

The Yellowstone Trail Association and several other strong organizations are rendering invaluable

aid in bettering routes to these parks, and in supplying automobile tourists with reliable information.

All roads from the four park entrances, including Cody and Moran, Wyoming, the main loop road, and all side roads are tabulated in the Complete Road Log herein detailed. These should be carefully followed so that one may not knowingly pass important places of interest. The detail maps show hotels, camps, ranger stations, natural objects of interest, paths and roads, automobile camps, stores and picture shops.

IMPORTANT DON'TS

DON'T leave your camp fires burning.
DON'T throw away pipe ashes, cigar or cigarette stumps without completely extinguishing the sparks.
DON'T build fires in tree mould or near logs or brush.
DON'T build larger fires than necessary.
DON'T leave your camp uncleaned.
DON'T deface anything in the park with your name or initials.
DON'T cut any green timber.
DON'T collect specimens of any kind.
DON'T feed the bears.
DON'T drive on the wrong side of the road.
DON'T run by STOP signs.
DON'T disregard the Red Flag SLOW-UP marker.
DON'T fail to keep to the RIGHT on all turns.
DON'T fail to signal on blind turns.
DON'T park your car on a turn.
DON'T speed.

The above DON'TS are intended to lighten the burden of the Rangers in keeping the park, and traffic through the park in harmony.

The Rangers are well informed on the park, and on park customs, and if called upon for information can render valuable assistance to the traveler.

DISTANCES.

Regular Loop Road and Entrances:

	Miles
NORTHERN ENTRANCE (NE) (Gardiner, Mont.) to Mammoth Hot Springs (MS)	4.5
Mammoth Hot Springs (MS) to Norris Junction (NJ)	20.3
Norris Junction (NJ) to Madison Junction (MJ)	14.1
WESTERN ENTRANCE (WE) (West Yellowstone, Mont.) to Madison Junction (MJ)	13.5
Madison Junction (MJ) to Old Faithful (OF)	16.0
Old Faithful (OF) to West Thumb (WT)	18.9
SOUTHERN ENTRANCE (SE) to West Thumb (WT)	23.6
West Thumb (WT) to Lake Junction (LJ)	16.9
EASTERN ENTRANCE (EE) to Lake Junction	27.0
Lake Junction (LJ) to Canyon Junction (CJ)	14.3
Canyon Junction (CJ) to Tower Fall Junction (TJ)	19.3*
Tower Fall Junction (TJ) to Mammoth Hot Springs (MS)	18.1

Side Trips:

Canyon Junction (CJ) to Norris Junction (NJ) (Cutoff)	11.0
Canyon Junction (CJ) to Summit of Mt. Washburn	10.5
Tower Fall Junction (TJ) to Buffalo Ranch	10.8
Tower Fall Junction (TJ) to Cooke City	33.9
Around Bunsen Peak from Mammoth Hot Springs (MS)	8.0

Total Mileage of Park Trips IN and OUT the Same Entrance:

via NORTHERN ENTRANCE	146.9*
via WESTERN ENTRANCE	164.9*
via SOUTHERN ENTRANCE	185.1*
via EASTERN ENTRANCE	191.9*

NOTE—Cody, Wyo., is 55.2 miles east of the Eastern Entrance.

Moran, Wyo., is 25.5 miles south of the Southern Entrance.

Grasshopper Glacier is 12.2 miles from Cooke City (by trail).

Cooke City is 33.9 miles from Tower Junction (TJ).

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*via Dunraven Pass and Tower Fall.

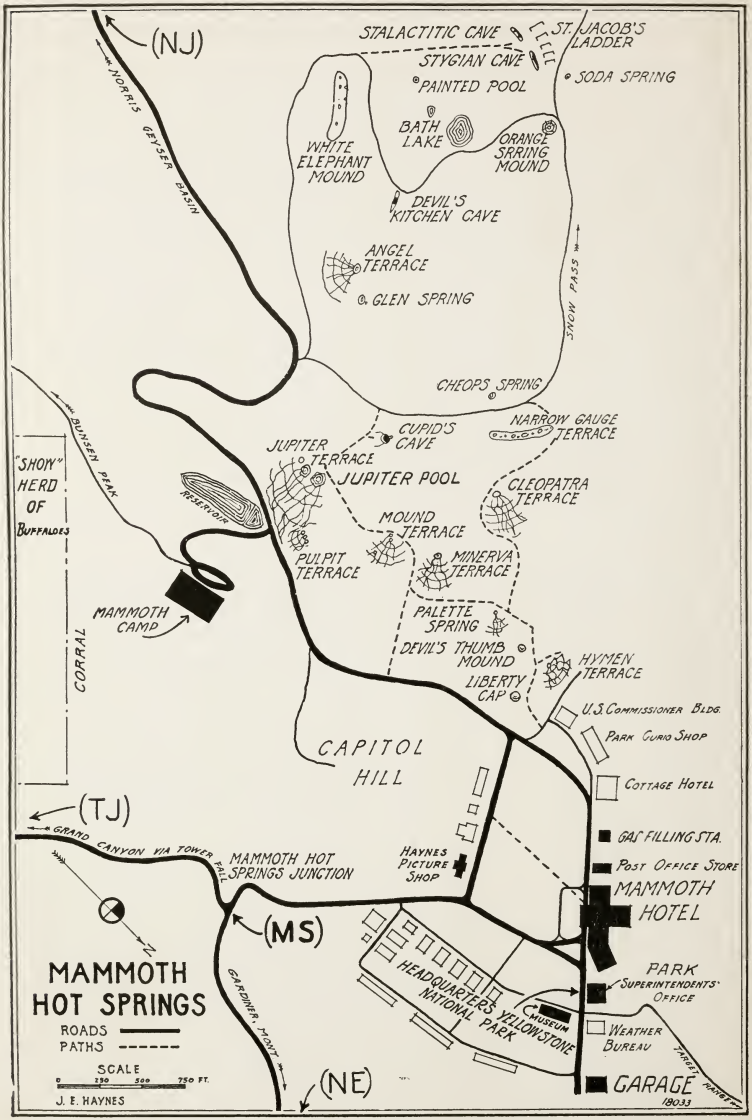
COMPLETE ROAD LOG

GARDINER, MONT., Northern Entrance (NE) to MAMMOTH HOT SPRINGS JUNCTION (MS), 4.5 Miles.

0.0 Arch and Government Checking Sta., at park boundary.
0.3 Gardiner river at left.
1.4 Eagle Nest Rock (Osprey's Nest) on cliff at left.
1.6 Drive slow; keep to right; signal on blind turns.
2.7 Mt. Everts at left. Garden at right.
2.9 Bridge, Gardiner River. Montana-Wyoming line, 2.9½.
3.2 Boiling River (left), enters Gardiner River.
3.9 Bunsen Peak ahead in distance.
4.4 Jupiter Terrace ahead.
4.5 **Mammoth Hot Springs** Junction (MS). Turn right. Left road is from Tower Fall.

MAMMOTH HOT SPRINGS JUNCTION (MS) to NORRIS JUNCTION (NJ), 20.3 Miles.

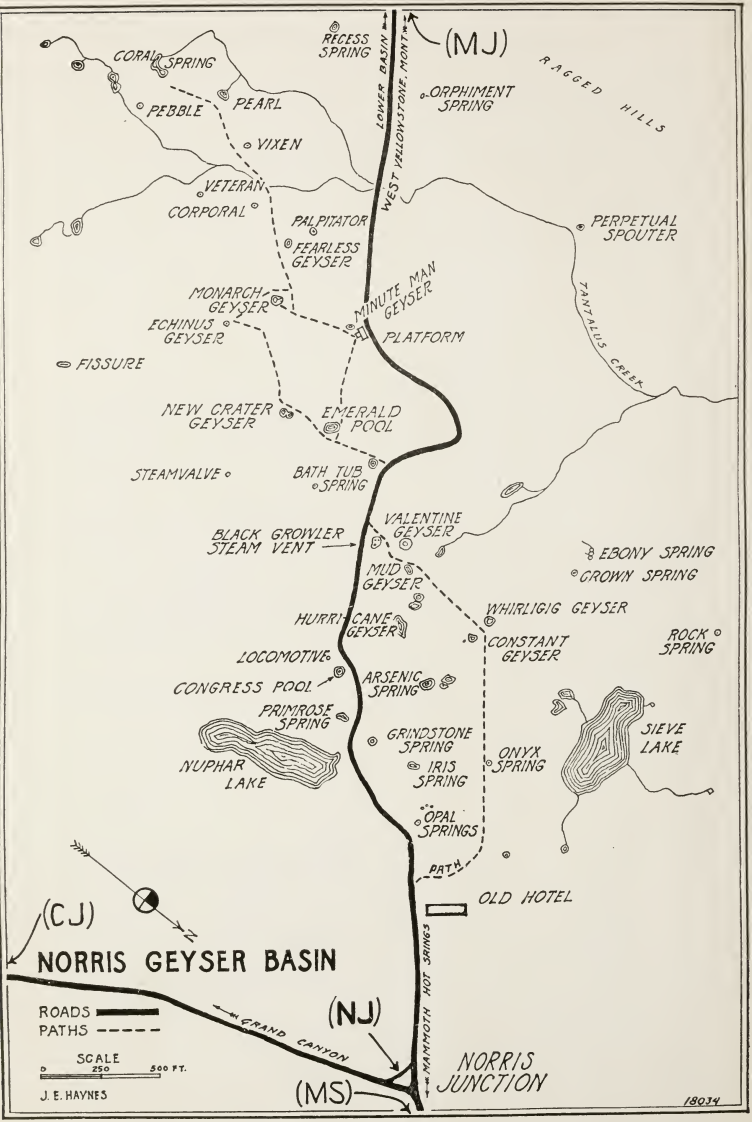
4.5 **Mammoth Hot Springs Junction (MS).** Turn right.
4.7 Haynes Picture Shop at left—Pictures, Post Cards, **Films, Developing, Printing, Enlarging, and information about photographing in the park.**
4.8 **Yellowstone Park Superintendent's Office—Information, File Complaints.** Museum, Information Service, **Maps,** Etc., Weather Bureau, Garage.
4.9 **Mammoth Hotel.**
5.0 Whittaker's Store, Gas Filling Station.
5.1 Park Curio Shop—curios. Road leads past terraces to
5.5 **Mammoth Camp.** Road leads past Jupiter Terrace.
6.1 Angel Terrace at right.
6.5 Snow Pass trail enters from right.
7.7 Hoodoo rocks.
7.8 Silver Gate.
8.6 Golden Gate, Bunsen Peak at left.
8.8 Rustic Fall, Glen Creek.
9.1 Enter Swan Lake Valley. Bunsen Peak road from Osprey Falls enters from left.
9.2 **Mt. Holmes and adjacent peaks ahead. Electric Peak, alt. 11,155 ft., in right distance.**
9.5 Snow Pass trail enters from right.
9.6 Swan Lake at right.
12.1 Bridge, Gardiner River. Gallatin trail enters from right.


(NJ)
NORRIS GEYSER BASIN
STALACTITIC CAVE
ST. JACOB'S LADDER
STYGIAN CAVE
PAINTED POOL
SODA SPRING
BATH LAKE
WHITE ELEPHANT MOUND
ORANGE SPRING MOUND
DEVIL'S KITCHEN CAVE
ANGEL TERRACE
GLEN SPRING
SNOW PASS
CHEOPS SPRING
CUPID'S CAVE
NARROW GAUGE TERRACE
JUPITER TERRACE
JUPITER POOL
CLEOPATRA TERRACE
MOUND TERRACE
PULPIT TERRACE
MINERVA TERRACE
PALETTE SPRING
DEVIL'S THUMB
MOUND
LIBERTY CAP
HYMEN TERRACE
U.S. COMMISSIONER BLDG.
PARK CURIO SHOP
COTTAGE HOTEL
GAS FILLING STA.
POST OFFICE STORE
MAMMOTH HOTEL
PARK SUPERINTENDENTS' OFFICE
WEATHER BUREAU
GARAGE
"SHOW" HERD OF BUFFALOES
BUNSEN PEAK
RESERVOIR
MAMMOTH CAMP
CORRAL
CAPITOL HILL
(TJ)
GRAND CANYON VIA TOWER FALL
MAMMOTH HOT SPRINGS JUNCTION
HAYNES PICTURE SHOP
(MS)
HEADQUARTERS YELLOWSTONE NATIONAL PARK
MUSEUM
GARDINER, MONT.
(NE)
YANCEY HUNTER
MAMMOTH HOT SPRINGS
ROADS
PATHS
SCALE
0 250 500 750 FT.
J. E. HAYNES
18033

12.5 Bridge, Obsidian creek. Riverside-Willow park trail enters from right.
14.7 Beaver dam and hut at right.
15.4 Apollinaris spring at left. Automobile camp grounds at right.
15.6 Bridge, Obsidian creek.
16.2 Crystal spring.
16.7 Bridge, Obsidian creek.
16.8 Obsidian Cliff, volcanic glass.
20.3 Roaring mountain at left.
20.8 First Twin Lake at right.
20.9 Second Twin Lake.
21.7 Good camp.
21.9 Bijah spring at right.
22.7 Frying pan hot spring at right.
24.4 **Norris Ranger Station and Norris Public Automobile Camp** at left. Turn right over bridge. Gibbon River.
24.8 **Norris Junction (NJ).** Turn right. Left road is from Canyon Junction.

NORRIS JUNCTION (NJ) to MADISON JUNCTION (MJ), 14.1 Miles.

24.8 **Norris Junction (NJ).** Turn right.
25.1 Norris Geyser Basin. Hotel (closed) at right.
25.3 Congress Pool at left. Constant Geyser 200 yards, at right.
25.4 Black Growler Steam Vent at right.
25.7 Minute Man Geyser at left. Monarch Geyser 100 yards, at left.
26.5 **Enter Elk Park. Recess Spring at left.**
27.2 Turn right.
27.4 Gibbon River at right.
27.7 Duck rock in river.
27.9 Chocolate Spring on river bank.
28.3 Gibbon meadow. Good camp.
29.1 Trail enters from Gibbon Paint Pots, one-half mile at left.
29.4 Gibbon Hill at left. Monument Geyser Basin on top of right knoll.
29.8 Bridge, Gibbon River.
30.2 Beryl Spring, the hottest in the park, at right.
31.0 Bridge, Gibbon River.
33.2 Iron Spring at right.
33.7 Gibbon Falls, 84 ft. high, at left.
34.0 Good camp at left.
34.6 Bridge, Gibbon River.


RECESS SPRING
(MJ)
CORAL SPRING
PEBBLE
PEARL
VIXEN
VETERAN
CORPORAL
PALPITATOR
FEARLESS GEYSER
LOWER BASIN
WEST YELLOWSTONE, MONT.
ORPHIMENT SPRING
RAGGED HILLS
PERPETUAL SPOUTER
TANTALUS CREEK
MONARCH GEYSER
ECHINUS GEYSER
MINUTE MAN GEYSER
PLATFORM
FISSURE
NEW CRATER GEYSER
EMERALD POOL
STEAMVALVE
BATH TUB SPRING
VALENTINE GEYSER
BLACK GROWLER STEAM VENT
EBONY SPRING
CROWN SPRING
MUD GEYSER
WHIRLIGIG GEYSER
HURRICANE GEYSER
CONSTANT GEYSER
ROCK SPRING
LOCOMOTIVE
CONGRESS POOL
ARSENIC SPRING
PRIMROSE SPRING
GRINDSTONE SPRING
ONYX SPRING
SIEVE LAKE
NUPHAR LAKE
IRIS SPRING
OPAL SPRINGS
PATH
OLD HOTEL
(CJ)
N
NORRIS GEYSER BASIN
ROADS
PATHS
GRAND CANYON
(NJ)
MAMMOTH HOT SPRINGS
NORRIS JUNCTION
SCALE
0 250 500 FT.
(MS)
J. E. HAYNES
18034

35.1 Turn right across bridge. Mesa road (left) is abandoned.
37.7 Good camp.
37.9 Hot lake at right, turn left with road.
38.9 **Madison Junction (MJ).** Take left road. Right road is from West Yellowstone, Mont., Western Entrance (WE), 13.5 miles. (For continuation, skip West Yellowstone to Madison Junction table, which follows immediately.)

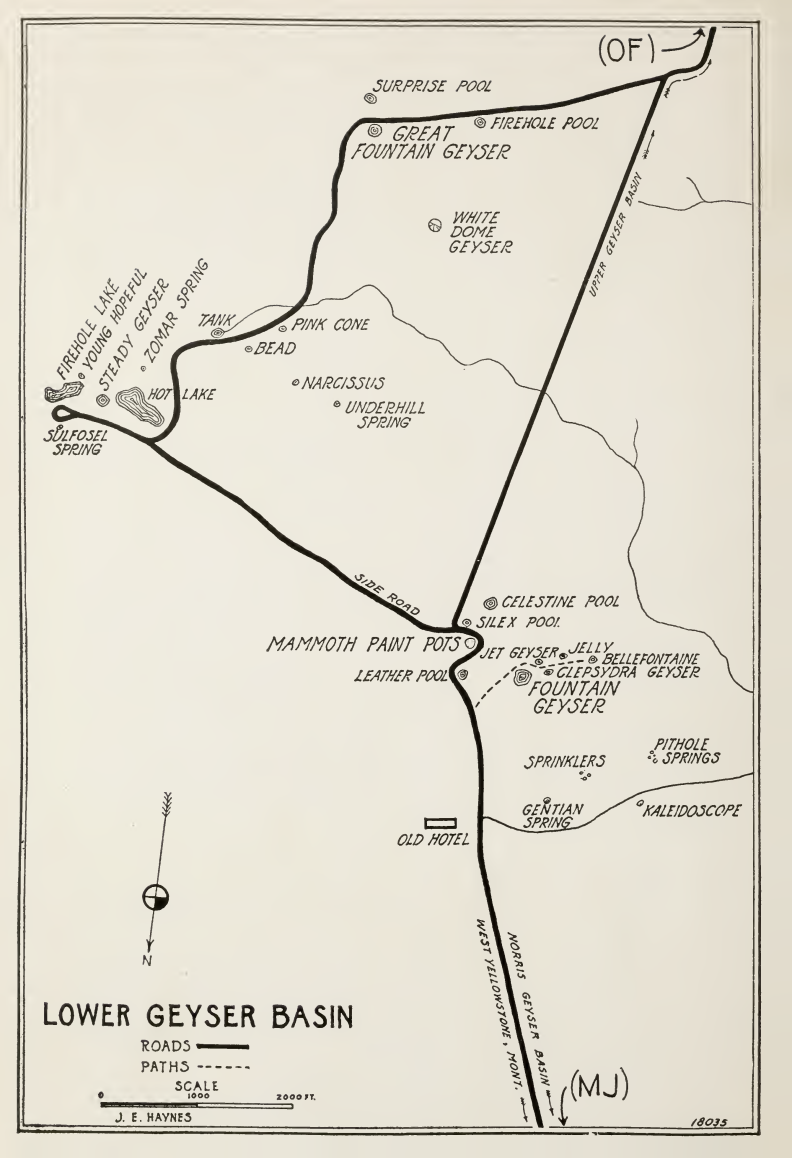
WEST YELLOWSTONE, MONT., Western Entrance (WE) to MADISON JUNCTION (MJ), 13.5 Miles.

0.0 Government Checking Sta., at park boundary.
0.2 Christmas Tree park.
3.3 Madison River at left.
4.0 **Riverside Ranger Station** at right. Riverside-Willow park trail enters from left. Madison trail at right.
4.8 Keep left.
5.1 Gallatin mountain range in left distance.
7.5 Bridge, Madison River.
9.6 Purple mountain at left.
10.3 Mt. Haynes at right.
13.5 **Madison Junction (MJ).** Left road is from Norris Junction. Turn right to Upper Geyser Basin—Old Faithful (OF), 16.0 miles.

MADISON JUNCTION (MJ) to UPPER GEYSER BASIN, OLD FAITHFUL (OF), 16.0 Miles.

Set mileage indicator at—
38.9 **Madison Junction (MJ).** Turn right.
39.1 Bridge, Gibbon River, National Park Mt. at right.
41.1 Keep right. Abandoned Mesa road enters from left.
41.2 Firehole Cascade at right.
43.3 Cold Spring near river at right.
46.6 **Fountain Ranger Station** at left. Keep left.
45.2 Bridge, Nez Perce Creek. Good camp.
46.5 Lower Geyser Basin. Fountain Hotel (closed) at left.
46.9 Mammoth Paint Pots. Fountain Geyser 100 yards at right.
47.0 Turn right. Left side road leads to Great Fountain Geyser, Firehole Lake, etc., but is rough and has a few small fords; it re-enters main road further on.

Side Trip—Road bad, drive carefully.
0.0 Take left side road at 47.0.
1.0 Black Warrior Geyser. Keep left
1.1 Firehole Lake. Return past Black Warrior.

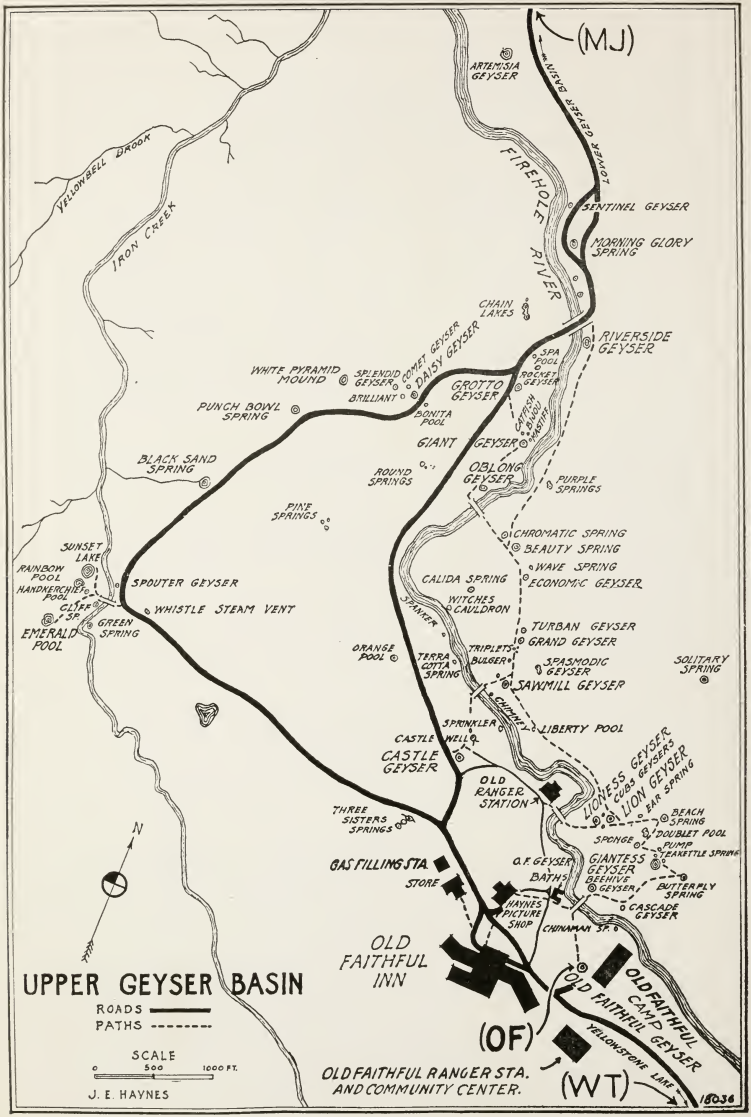

(OF)
SURPRISE POOL
FIREHOLE POOL
GREAT FOUNTAIN GEYSER
WHITE DOME GEYSER
UPPER GEYSER BASIN
FIREHOLE LAKE
YOUNG HOPEFUL
STEADY GEYSER
ZOMAR SPRING
TANK
PINK CONE
BEAD
HOT LAKE
NARCISSUS
UNDERHILL SPRING
SULFOSEL SPRING
SIDE ROAD
CELESTINE POOL
SILEX POOL
MAMMOTH PAINT POTS
JET GEYSER
JELLY
BELLEFONTAINE
CLEPSYDRA GEYSER
LEATHER POOL
FOUNTAIN GEYSER
SPRINKLERS
PITHOLE SPRINGS
GENTIAN SPRING
KALEIDOSCOPE
OLD HOTEL
N
WEST YELLOWSTONE, MONT.
NORRIS GEYSER BASIN
(MJ)
LOWER GEYSER BASIN
ROADS
PATHS
SCALE
0 1000 2000 FT.
J. E. HAYNES
18035

1.4 Turn left across several small streams.
1.7 Bath Lake at left.
1.8 Bear left past hot springs, marked "Dangerous."
1.9 Bear right.
2.1 Ford small creeks.
2.4 Great Fountain Geyser at right. Dome Geyser in right distance. Surprise pool on knoll at left 50 yards.
2.5 Bear left.
2.6 Firehole Pool at right.
3.3 Re-enter main road. Keep left.

49.3 Excelsior Geyser Crater and Prismatic Lake at right.
49.4 Turn right across bridge, Firehole River.
49.8 Straight. Cut-off road from Fountain Ranger Sta. enters from right.
50.1 Bridge, Firehole River.
50.2 Hot pool at left.
52.5 **Biscuit Basin and Jewel Geyser at right across river.**
52.9 Gem spring at right.
53.0 Artemisia Geyser crater at right.
53.3 Right side road leads to Morning Glory Spring.
53.4 Morning Glory Spring, few yards at right. Fan and Mortar Geysers.
53.5 Riverside Geyser at left. Turn right, bridge, Firehole River.
53.7 Chrome springs at right. Grotto Geyser at left.
53.8 Junction. Right side road leads to Punch Bowl spring, Emerald Pool, etc.

Side Trip—
0.0 Take right side road. at 53.8.
0.1 Daisy Geyser and White Pyramid at right.
0.4 Punch Bowl spring at right.
0.6 Black Sand spring at right.
0.9 Spouter Geyser at right.
1.0 Footbridge, Iron Creek, to Rainbow Pool, Sunset Lake, Handkerchief Pool and Emerald Pool, 150 yds. at left.
1.1 Turn left. Whistle Geyser at left.
1.9 Three Sisters springs at right.
2.1 Re-enter main road. Turn right.

54.6 Hamilton Curio store at right. Curios, Merchandise, Gas.
54.7 Haynes Picture shop at left. Films, Post Cards, Pictures, etc. **Old Faithful Inn.** Old Faithful Geyser in distance ahead.


(MJ)
ARTEMISIA GEYSER
LOWER GEYSER BASIN
FIREHOLE RIVER
SENTINEL GEYSER
MORNING GLORY SPRING
YELLOWBELL BROOK
IRON CREEK
CHAIN LAKES
RIVERSIDE GEYSER
SPA POOL
ROCKET GEYSER
COMET GEYSER
DAISY GEYSER
WHITE PYRAMID MOUND
SPLENDID GEYSER
BRILLIANT
GROTTO GEYSER
CATFISH BIJOU MASTIFF
PUNCH BOWL SPRING
BONITA POOL
GIANT GEYSER
BLACK SAND SPRING
ROUND SPRINGS
OBLONG GEYSER
PURPLE SPRINGS
PINE SPRINGS
CHROMATIC SPRING
BEAUTY SPRING
SUNSET LAKE
RAINBOW POOL
HANDKERCHIEF POOL
CLIFF SP.
EMERALD POOL
SPOUTER GEYSER
WHISTLE STEAM VENT
GREEN SPRING
WAVE SPRING
ECONOMIC GEYSER
CALIDA SPRING
WITCHES CAULDRON
SPANKER
TURBAN GEYSER
GRAND GEYSER
ORANGE POOL
TERRA COTTA SPRING
TRIPLETS BULGER
SPASMODIC GEYSER
SAWMILL GEYSER
SOLITARY SPRING
CHIMNEY
SPRINKLER
LIBERTY POOL
CASTLE WELL
CASTLE GEYSER
OLD RANGER STATION
LIONESS GEYSER
CUBS GEYSERS
LION GEYSER
EAR SPRING
BEACH SPRING
DOUBLET POOL
THREE SISTERS SPRINGS
SPONGE
PUMP
TEAKETTLE SPRING
GAS FILLING STA.
O.F. GEYSER
GIANTESS GEYSER
BEEHIVE GEYSER
BUTTERFLY SPRING
STORE
BATHS
HAYNES PICTURE SHOP
CASCADE GEYSER
CHINAMAN SP.
OLD FAITHFUL INN
OLD FAITHFUL CAMP
OLD FAITHFUL GEYSER
(OF)
YELLOWSTONE LAKE
(WT)
OLD FAITHFUL RANGER STA. AND COMMUNITY CENTER.
N
UPPER GEYSER BASIN
ROADS
PATHS
SCALE
0 500 1000 FT.
J. E. HAYNES
18036

54.8 **Old Faithful Ranger Station** and **Community Center** across road from Old Faithful Geyser. **Public Auto Camp** in forest back of Ranger Station. **Old Faithful Camp**, 55.0.
54.9 **Upper Geyser Basin**, Old Faithful (OF).

UPPER GEYSER BASIN, Old Faithful (OF) to WEST THUMB of Yellowstone Lake (WT), 18.9 Miles.

54.9 **Upper Geyser Basin (OF).**
55.0 Old Faithful Camp.
55.5 Bridge, Firehole River. Good camp.
56.6 Kepler Cascades. Platform.
57.2 Bridge, Firehole River.
58.2 Turn left across bridge. Right side road 0.8 to Lone Star Geyser.
60.8 National Park Service Engineer Station.
62.8 Norris Pass at right.
63.5 Isa Lake, Continental Divide, alt. 8,240 ft., Craig Pass.
63.7 Corkscrew hill. SLOW. Signal on turns. KEEP RIGHT.
64.3 Bridge, Heron Creek.
64.7 DeLacy Creek, National Park Service Engineer Station. Good camp.
65.2 Shoshone Point. Shoshone Lake at right.
68.3 National Park Service Engineer Sta., at left.
70.1 Continental Divide, second crossing, alt. 8,345 ft.
72.8 Lake View. Yellowstone Lake ahead.
73.8 **Thumb Ranger Station, West Thumb** of Yellowstone Lake (WT). Right road to Jackson Lake, Moran, and Lander, Wyo. Left road to Lake Junction (LJ), and Grand Canyon.
(For continuation, skip Lander, Wyo., etc., to West Thumb table, which follows immediately.)

LANDER, WYO., via Moran, Wyo., and Southern Entrance. (SE) to WEST THUMB, (WT), 201.7 miles.

0.0 **Lander, Wyo.**
4.7 Millford.
17.1 Fort Washakie.
37.3 Bull Lake Creek.
45.7 J. K. Ranch.
71.1 Circle Ranch.
83.5 Dubois. Tetons to the west, Absaroka Range on the north.
103.6 Tie Camp.
108.5 Brooks Lake. Two-Gwo-Tee Inn.

116.5 Two-Gwo-Tee Pass. Glaciers to the south.
123.9 Buffalo Creek. Jackson Hole country.
153.5 **Moran.** Amoretti Inn.
158.0 Pilgrim Creek.
165.6 Arizona Creek.
166.7 Jackson Lake; Teton Mountains to the left.
176.0 Snake River.
178.4 **Snake River Ranger Station, Southern Entrance (SE).**
180.5 Crawfish Creek. Moose Fall 100 yards to the right.
186.8 Lewis Canyon at right.
189.4 Lewis River. Lewis Fall at left.
190.0 Aster Creek.
193.0 Head of Lewis Lake.
198.6 Continental Divide.
201.6 Yellowstone Lake at right.
201.7 **West Thumb, (WT)** and **Thumb Ranger Station.** Turn right for Yellowstone Lake Hotel. Turn left for Upper Geyser Basin.

WEST THUMB, Yellowstone Lake (WT) to LAKE JUNCTION (LJ), 16.9 Miles.

Set mileage indicator at—
73.8 **West Thumb (WT).** Turn to right. Left road from Upper Basin.
81.8 Knotted Pines.
85.8 Natural Bridge 150 yards at left.
88.9 Government Fish Hatchery, at right.
89.0 Straight.
89.3 **Lake Hotel.**
89.4 Hamilton Lake Store.
89.5 **Public Auto Camp.** Good Camp.
89.6 **Lake Camp** at left.
89.8 **Lake Ranger Station** at right.
90.7 **Lake Junction (LJ).** Keep left. Right road from Cody, Wyo., 82.2 miles.
(For continuation skip Cody, Wyo., to Lake Junction table, which follows immediately.)

CODY, WYO., via Eastern Entrance (EE) to LAKE JUNCTION, (LJ), 82.2 Miles.

0.0 Cody, Wyo. Set mileage indicator at 0.5 at Shoshone River bridge between the Burlington Cody Cafe and Cody. Turn west up 14 per cent grade.
1.7 Follow telephone line.
3.1 Sulphur mine at left 0.5 mile.
3.3 Straight. De Maris springs 0.5 mile at left.

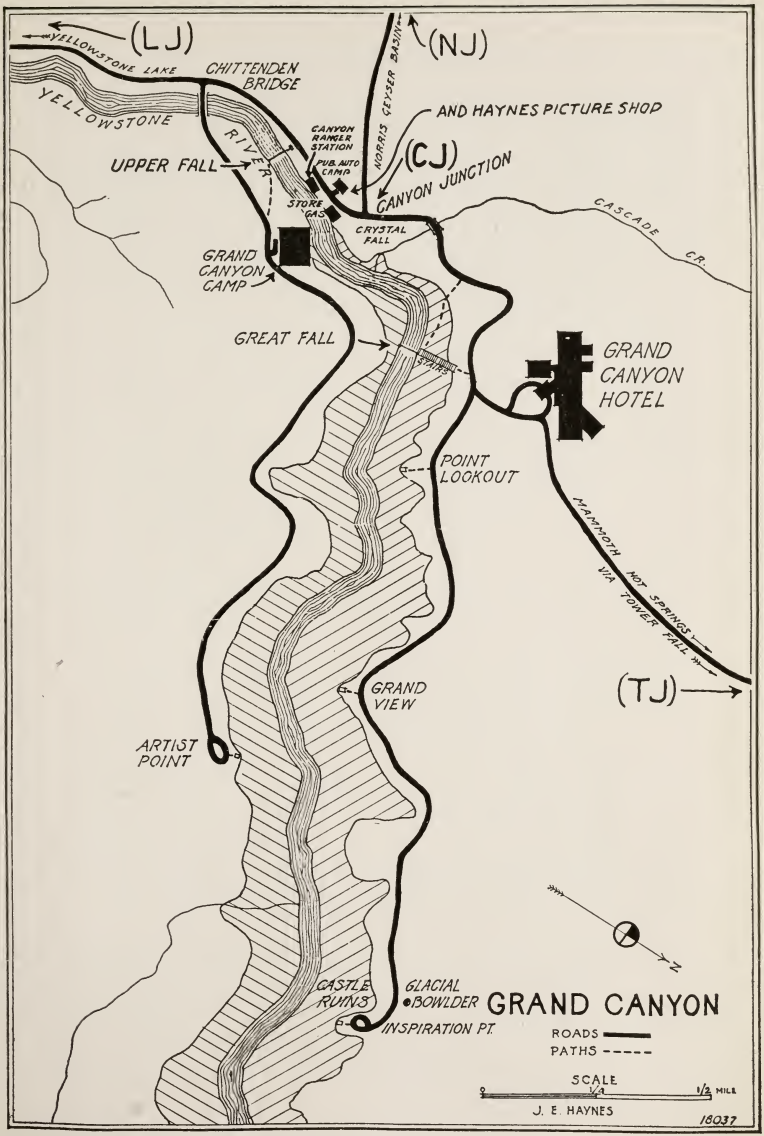
4.1 Enter Shoshone canyon.
6.9 First tunnel.
7.2 **Second tunnel. Shoshone dam ahead.**
7.6 Top of Shoshone dam at left.
7.7 Third tunnel. **Slow.**
8.2 Fourth tunnel.
8.3 Fifth and sixth tunnels.
12.6 Shoshone reservoir at left.
18.4 Morris ranch at left.
21.6 Cross bridge, Shoshone River and turn right.
22.2 School house at right.
23.2 Hollister's ranch.
24.2 Frost and Richard's ranch.
26.7 Enter Shoshone National Forest. Left side road to Canyon Creek forest ranger station.
28.5 Overhanging rock cliff.
28.7 Good camp.
29.0 Goose at right.
29.2 Holy City at right. Wooden Shoe and Ptarmigan mountain at left.
29.3 Clock Tower Creek.
29.8 Thor's Anvil at right.
30.6 Thousand foot cliff.
31.4 Wapiti forest ranger station at right.
32.2 Bridge, Elk fork of Shoshone River.
32.3 **Aspen grove.**
34.4 Straight.
34.6 Bridge, Clear Water Creek.
37.2 Straight.
41.1 The Palisades.
42.1 Mesa Creek. Good camp.
42.6 Elephant head at right. Mutilated hand in right distance.
43.2 Chimney Rock and Creek.
45.8 Right road to Holm Lodge, 0.3 mile.
46.2 Libby Creek flats at left. Right road re-enters from Holm Lodge.
46.8 Take right road.
47.6 Eagle Creek and trail to Mountain Creek and Thoro**fare at left.**
48.4 Dave Jones' trail at right.
49.2 Aspen woods.
50.6 Boundary of state game preserve. Canfield Canyon at left.
52.4 Sunlight trail at right.
52.8 Bridge, North Fork Shoshone River.
52.9 Pahaska Tepee Lodge.

55.2 **Sylvan Pass Ranger Station** at park boundary, Eastern Entrance, (EE). Middle creek at left.
55.3 Good camp at right.
62.1 **Spiral Bridge and "S" Hill.**
62.9 Sylvan Pass. Elevation, 8,650 feet.
63.4 Snow Fall at left.
63.6 Lake Eleanor.
64.4 Sylvan Lodge (closed) at left.
65.2 Sylvan Lake.
68.6 Good camp at left.
71.3 Teton Point. Yellowstone Lake in distance.
71.8 Lake at left.
74.1 Wedded trees at left.
75.0 Good camp.
75.6 Turbid Lake.
76.3 Osprey nest in tree at right.
80.6 **Fishing Bridge Public Automobile Camp Grounds.**
81.8 Good camp.
82.0 Fishing bridge, Yellowstone River.
82.2 **Lake Junction, (LJ).** Right road to Grand Canyon. left road to **Lake Camp, Lake Ranger Station, Lake Hotel, Public Automobile Camp Grounds,** 1.3 miles.

LAKE JUNCTION (LJ) to CANYON JUNCTION (CJ), 14.3 Miles.

Set mileage indicator at—

90.7 **Lake Junction (LJ).** Turn right (north) to Canyon Junction.
93.8 Yellowstone River at right.
96.6 Hot Springs at left.
96.7 Platform, Mud Volcano and Dragon's Mouth Spring at left.
97.1 Enter Hayden valley.
98.4 Bridge, Elk Antler Creek.
98.5 Northern Pacific Railway monad trademark outlined by Trout Creek at left.
98.7 Keep right. Left road to Sulphur mountain and spring.
98.9 Bridge, Trout Creek. National Park Service Engineer Station at left.
99.3 Dunraven Peak and Mt. Washburn in distance ahead.
101.8 Bridge, Alum Creek. North end of Hayden valley.
103.8 Bridge, Otter Creek.
104.2 Turn right. Left road to N. P. S. Engineer Station (closed to tourists).
104.3 Chittenden bridge, Yellowstone River. Cross bridge to **Grand Canyon Camp,** 104.9, Uncle Tom's Trail, and Artist Point, 105.9.


(LJ)
YELLOWSTONE LAKE
CHITTENDEN BRIDGE
YELLOWSTONE RIVER
(NJ)
NORRIS GEYSER BASIN
AND HAYNES PICTURE SHOP
CANYON RANGER STATION
PUB. AUTO CAMP
STORE GAS
(CJ)
CANYON JUNCTION
UPPER FALL
CRYSTAL FALL
CASCADE CR.
GRAND CANYON CAMP
GREAT FALL
GRAND CANYON HOTEL
POINT LOOKOUT
MAMMOTH HOT SPRINGS VIA TOWER FALL
(TJ)
GRAND VIEW
ARTIST POINT
CASTLE RUINS
GLACIAL BOWLDER
INSPIRATION PT.
GRAND CANYON
ROADS
PATHS
SCALE
1/2 MILE
J. E. HAYNES
18037

104.4 Bridge over ravine. Rapids above the Upper Fall at right.
104.7 Platform, trail to brink of Upper Fall.
104.8 **Canyon Ranger Station.** Keep right. Left road closed.
104.9 **Public Auto Camp** and **Haynes Picture Shop** on hill south (left) of store just off Canyon-Norris road. **Whittaker Store**—gasolene, supplies, at right.
105.0 **Canyon Junction (CJ).** Keep right. Left road to Public Auto Camp; and to Norris Junction (NJ), 11.0 miles.
Norris Junction (NJ), 11.0 miles.

CANYON JUNCTION (CJ) to TOWER FALL JUNCTION (TJ), 19.3 Miles.

105.0 **Canyon Junction (CJ).** Keep right (north).
105.1 Bridge, Cascade Creek. Trail to Crystal Falls, 200 yards, on the right at north end of bridge.
105.5 Platform, 494 steps down to brink of Great Fall. Turn left. Right side road to Inspiration Point.

Side Trip—
0.0 Take right road at 105.5.
0.5 Path to Pt. Lookout, and trail to Red Rock at right.
0.8 Platform, Grand View.
1.6 Glacial Boulder at left.
1.8 Castle Ruins on Canyon wall.
1.9 Turn right around loop.
2.0 Inspiration Point.
Return to main road and turn right.

Set mileage indicator at—
105.5 Main road. Turn north.
105.8 **Grand Canyon Hotel.**
106.1 Turn left.
106.3 Crossroads. Keep in northerly direction.
106.7 Mt. Washburn in distance ahead.
110.5 Water. Fill radiator and water bag.
110.8 Dunraven Peak at left.
111.3 Grand Canyon in right distance.
111.9 Dunraven Pass, alt. 8,900 ft. Keep left in bad weather. Right side road to summit of Mt. Washburn, re-enters Dunraven Pass road on north side of the mountain.

Side trip to summit of Mt. Washburn.
0.0 Turn right up grade at 111.9.
1.4 Switchback roadway.

3.6 Summit of Mt. Washburn, alt. 10,100 ft. In descending, keep engine in gear in either low or second speed to prevent brakes from overheating on the 10-mile descent to Tower Fall.
3.9 Take left road down north side of the mountain.
6.5 Junction. Keep right. Left road is from Dunraven Pass. Log building.

Set mileage indicator at—
115.8 Junction. Right road from summit of Mt. Washburn. Log building. Keep in northerly direction.
118.9 Tower Fall **Public Auto Camp Grounds.** Information Station at **Haynes Picture Shop and General Store,** Films, Post Cards, Pictures, Foodstuffs and Tourists' Supplies, Etc. Footpath to Tower Fall and Fishing grounds.
119.3 Platform, bridge, Tower Creek.
119.5 Towers at right.
119.7 Columnar basalt formation in Yellowstone Canyon.
119.8 Overhanging Cliff.
120.0 Needles at right.
121.5 **Roosevelt Camp.** 0.3 miles at left.
121.6 Lost Creek.
121.7 **Tower Fall Junction (TJ).** Straight 0.2 to **Tower Fall Ranger Station.** Right side road to Buffalo Ranch, 10.8 miles.

Side trip to Buffalo Ranch, Cooke City and Grasshopper Glacier—Buffalo herd can be seen only by trail trip into the hills beyond the Lamar river.

0.0 Tower Fall Junction. Take right side road.
0.7 Beaver dams at left.
0.8 Bridge, Yellowstone River.
1.0 Keep right. Left road abandoned.
3.9 Keep to main road.
4.8 Bridge, Lamar river. Good camp.
10.8 Buffalo Ranch. Buffalo on range in the hills. Soda Butte on Cooke City road at 16.8 miles. Return to Tower Fall Junction.
33.9 Cooke City, Mont.
46.1 Grasshopper Glacier reached by trail only from Cooke City.

TOWER FALL JUNCTION (TJ), to MAMMOTH HOT SPRINGS JUNCTION (MS), 18.1 Miles.

121.7 **Tower Fall Junction (TJ).** Road leads west.
121.9 **Tower Fall Ranger Station** at left.

123.1 Left side road to petrified tree 0.5 miles. Good camp. Beaver dams.
123.2 Bridge.
125.8 Cold spring at left. Fill radiator and water bag.
128.1 Electric Peak in distance ahead. Gallatin Range at left.
128.6 Bridge.
132.6 Bridge, Blacktail Deer Creek.
134.7 Beaver dam and hut at left.
135.1 Wraith Falls at left.
135.2 Lava Creek Bridge.
135.7 Trail at right to Undine Falls.
135.9 Mt. Everts at right.
137.0 Sepulchre Mt. and Mammoth Hot Springs in distance ahead.
138.2 Trestle, the highest and longest in the park, Middle Gardiner River. Bunsen Peak at left.
139.7 National Park Service power plants. **Public Auto Camp** down the hill to the right.
139.8 **Mammoth Hot Springs Junction (MS).** Left road to **Haynes Picture Shop,** 0.2, **Park Superintendent's Office,** 0.3. **Mammoth Hotel,** 0.4. **Mammoth Camp,** 0.8 miles. Right road to Gardiner, Mont., Northern Entrance (NE), 4.5 miles.

ARCH AND CHECKING STATION, NORTHERN ENTRANCE 22631

TOUR OF THE PARK
FROM THE NORTHERN ENTRANCE

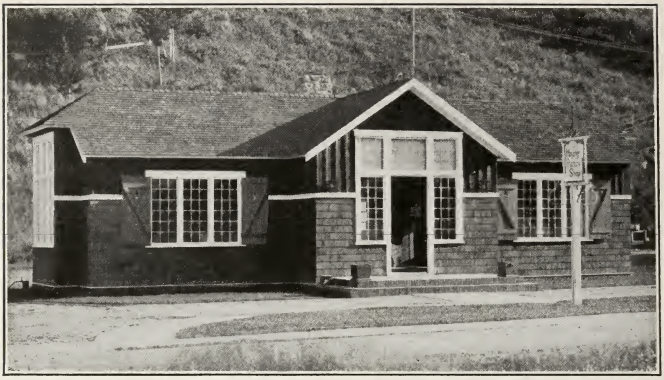
Gardiner Station, Northern Pacific Railway, and Gardiner are just outside of the park at the northern boundary. The Yellowstone Park Transportation Co. operates a line of automobile stages to all points in, and all entrances of the park.

Arch at Northern Entrance bearing the inscription, "Yellowstone National Park, Created by Act of Congress, March 1, 1872, for the Benefit and Enjoyment of the People," was built in 1903 by the government and was dedicated by President Roosevelt.

Gardiner Canyon.—On the drive to Mammoth Hot Springs an ascent of 875 feet is made in five miles. The elevation at Gardiner is 5,400 feet; at Mammoth, 6,275 feet.

Mt. Everts, at left, was named for T. C. Everts, who became separated from the exploring party in 1870 and on foot wandered about the park region thirty-seven

FORT YELLOWSTONE AT MAMMOTH HOT SPRINGS 14046



HAYNES PICTURE SHOP (OPPOSITE MAMMOTH HOTEL) 20118

days without food or firearms before being rescued. (See "Discovery of Yellowstone Park, 1870," by N. P. Langford.)

Fort Yellowstone, abandoned by the army, is the administrative headquarters of the park. The **Superintendent's Office, Museum,** and information service where maps, free circulars of information, and other data relating to Yellowstone and other national parks may be obtained, is situated here.

The **Haynes Picture Shop** at the left, carries a complete line of park pictures, which are well worth seeing, as well as photographic supplies and guide books. Developing, printing, enlarging, and information about photographing in the park are part of the Haynes service.

Mammoth Hotel, operated by the Yellowstone Park Hotel Co., is situated with the Yellowstone Park Headquarters at the foot of the hot spring terraces. Road follows south past terraces up slight incline to—

Mammoth Camp, operated by the Yellowstone Park Camps Co., and situated at the foot of Jupiter Terrace in sight of Bunsen Peak is one of the larger permanent camps of the park.

MAMMOTH HOTEL AND AUTOMOBILE STAGES 17225

Hymen Terrace, one of the most beautifully colored spots in the park, is on the main plateau at the right of Liberty Cap. A veil of steam softens and blends its vivid colorings, while innumerable water-glazed knobs reflect the sunlight like a thousand mirrors. This terrace is growing fast, and it is gravely feared that the openings may become choked by the abundance of the lime deposit. Should this happen it would be a matter of but a few days before the coloring would be gone, leaving the bare travertine rock exposed to the destructive forces of the elements.

Liberty Cap, an extinct hot spring cone, standing at the foot of Terrace Mountain, near the road, is 38 feet high and twenty feet in diameter at its base. It is formed of over-lapping layers of deposit, evidently having been built by an overflow of water through the orifice in the top.

Cleopatra Terrace, a short distance above Hymen Terrace, is a good example of the growing deposit. When the overflow from any of these hot springs changes its course, the algae, which produce the color, disappear from

MAMMOTH CAMP FROM TERRACES 20102

the abandoned runway, and soon the new course is brilliantly colored.

Minerva Terrace is colored one season and apparently dead another, so it is difficult to predict in advance of the season whether its spring will flow or not; usually, however, it is active.

Mound Terrace during 1918 became more active than usual, the northern face being beautifully colored over a considerable area, and the flow of water was greater than for several seasons past.

Pulpit Terrace is a mass of stalactites grown almost together. This part of Jupiter Terrace has been given a separate name, and, there is a tradition that a famous clergyman once actually delivered a sermon from this natural pulpit.

Jupiter Terrace, the greatest of them all, has been built up by the overflow from two very large hot pools which discharge their mineral-laden water over a large part of this great mound.

JUPITER SPRING 19023

Cupid's Cave is west of the pools on Jupiter Terrace. When active this brilliant terrace formation in an ashen setting of the ruins of former terrace life, presents a most striking and pleasing contrast. A few years ago the overflow re-entered the ground through an opening large enough for one to enter. There were stalactites above and stalagmites below, which gradually grew together and finally filled the opening. Lately there has been a noticeable diminution in the activity of all springs near this cave; and Canary spring has become quite dry.

Narrow Gauge Terrace during recent years has become less active. About ten years ago hot water flowed from many openings along this fissure, almost completely covering both sides. Now activity is confined to the western end.

Lookout Point.—The view from here is up the valley of the East Gardiner River through which the road

JUPITER TERRACE, TRAVERTINE FORMATION 10230

from the Grand Canyon and Tower Fall to Mammoth Hot Springs has been built.

Orange Spring Formation.—This isolated mound has been built up by a small spring in its top, to a height of 15 feet. From here the road leads a short distance east, up grade, to a ridge overlooking—

Bath Lake.—The lukewarm water supplied from a spring on the southern shore of this lake is very fine for bathing. The government has built a small bath-house on its northern shore. While there is no visible outlet to this lake, the water is always fresh, as it constantly escapes through fissures below the surface. Bathers should be very cautious, as the bed of Bath Lake is rough and the rock very sharp in places.

Devil's Kitchen may be safely entered by the stairway. This cave is the interior of an extinct hot spring as the character of the walls plainly show. It was first explored in 1881, at which time numerous bones of wild animals were found.

White Elephant.—Around the small springs on this travertine ridge are patches of colored algous

ORANGE SPRING FORMATION 19014

growths where lime is being deposited. The great size of the mound is an indication that these springs have been active probably for centuries.

Stalactitic Cave and Stygian Cave, above which is an old formation called St. Jacob's Ladder, are about 600 feet west of the White Elephant. Stygian Cave exhales the suffocating carbonic acid gas which has caused the death of many birds and small animals.

Angel Terrace is passed on the way from the White Elephant to the main road. This terrace is probably the most beautiful of all in point of coloring.

The Buffalo Herd.—The buffaloes or American bison of the park may be classed in three groups, namely: The "show" herd near Mammoth Hot Springs, which is fenced in; the "tame" herd on the Lamar River, 29 miles east of Mammoth Hot Springs, and the scattering wild bands which have not become connected with the herds directly under the government's care.

BUFFALO HERD NEAR MAMMOTH 10136

Geological.—The Yellowstone Park is geologically young, but so old that the slow erosive power of running water has carved furrows a thousand feet or more into its solid rock.

The mountains are mostly igneous; and all through the Park are evidences of violent volcanic eruptions as shown by extensive lava beds. Amygdaloid cliffs and great gnarled masses are common; there are obsidian cliffs, great geometrical blocks, petrifactions and geodes, besides the print of leaves in rock where forests have fallen prey to the flowing hot mud.

Some sedimentary deposits are also found here near the northern boundary, in the form of limestone beds, clays and shales. There were glacial invasions also, which have left hills of sand and gravel, and isolated bowlders at various points.

The most wonderful deposit in the region is this **Formation at Mammoth Hot Springs,** which is composed of pure calcium carbonate, dissolved from the limestone beds below and brought to the surface by the hot springs. It is many acres in extent—of unknown depth—and is the result of periods of successive deposition and

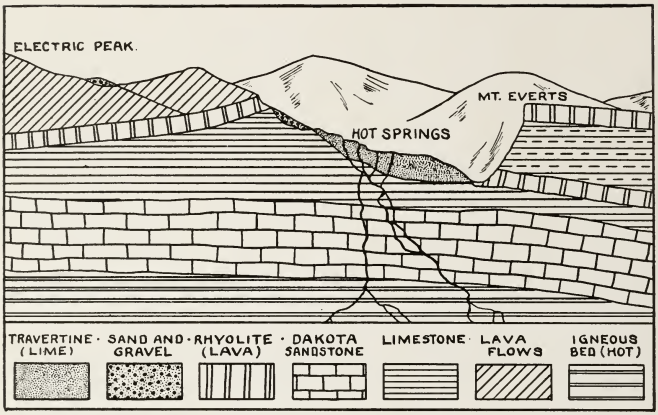
ANGEL TERRACE 19016

decay extending over a great length of time. The deposit is building where overflowed by water, and crumbling to a chalky powder where dry.

The water is heated by great masses of rock which have not yet cooled below the zone of percolating water. Such conditions are also seen today in New Zealand and Iceland.

Four factors are held responsible for the practically complete precipitation of the lime carried by the water to the surface; namely, (1) The "eating" process of the algous growth which thrives in the hot water. (2) The giving off of carbonic acid to the air. (3) The cooling of the water and (4) Evaporation.

The chief attraction of this great deposit is its beautiful coloring; harmonizing shades of yellow and brown with occasional streaks of dark green and red characterize the formation where the hotter water flows. The predominating rust color is found in the tepid water further



GEOLOGICAL PROFILE OF MAMMOTH HOT SPRINGS 10155

from the mouths of the hot springs. The abandoned portions of the deposit are a glaring chalk-white, the colorings being present only on the active terraces. It is the algae that color these terraces more beautifully than could natural mineral coloring, or the hand of man; the algous growth—a low form of plant life—cleaves closely to the rock in a velvet-like covering and requires hot or tepid water in which to live.

Nor are the pool colorings due to minerals; the United States Geological Survey states authoritatively, that these colors are due to the reflection and refraction of the light rays, influenced by the nature and color of the pool linings and their surroundings.

Silver Gate and Hoodoos.—The driveway from Mammoth to Golden Gate ascends the mountain by such easy grades that one does not realize that a thousand feet elevation is gained in less than three miles.

It passes through the limestone Hoodoos, a wild region heretofore inaccessible. Many theories are advanced as to the origin of the "Hoodoos." The most plausible is, that the immense quantity of deposit or formation seen lower

SILVER GATE, LIMESTONE HOODOOS 18080

down the valley, even as far as Gardiner River, two miles distant, was carried there in solution by the hot waters of Mammoth Springs, thus leaving honeycombed caves beneath; the present Hoodoo region was formed by the surfaces caving in, filling the cavern below with huge masses of fractured rock. This condition is seen over an area of about a square mile. In the midst of the "Hoodoos" the road makes an abrupt turn, passing between great blocks of limestone to which is applied the very appropriate name, "**Silver Gate.**"

Golden Gate, one of the most picturesque drives in the Park, is a rugged pass between the base of the lofty elevations of Bunsen Peak, and the southern extremity of Terrace Mountain. The sides of these rocky walls rise 200 to 300 feet above the roadway and are covered with a yellow lichen, suggesting its name.

Rustic Fall, at the west end of Golden Gate canyon, adds a charm to this beautiful spot; in the early part

GOLDEN GATE CANYON AND VIADUCT 10079

of the season the fall is especially fine. The stream, Glen Creek, is fed by mountain snows and springs, along the base of the hills, a mile or so away; at the fall, it leaps some sixty feet over a series of shallow basins worn into the dark, moss-covered ledge, and disappears underneath an accumulation of rock in the canyon.

Swan Lake Basin.—A pleasant surprise awaits the visitor immediately beyond Golden Gate, where the road comes suddenly into a broad mountain prairie hemmed in by snow-clad peaks. The magnificent Gallatin range rising abruptly from the foothills, composed of Antler Peak, Quadrant Mountain, and Mount Holmes (alt. 10,578 feet), are conspicuous in the foreground. About eight miles to the north is **Electric Peak** (alt. 11,155 feet), **the highest mountain in the Park,** which, containing a large amount of magnetic ore, attracts lightning during storms.

ELECTRIC PEAK, 11,155 FEET 10081

Apollinaris Spring is on the east side of the road near the ten-mile post—a delicious spring of natural Apollinaris water, as refreshing as the genuine article of commerce.

Obsidian Cliff, a bold escarpment of volcanic glass, is twelve miles south of Mammoth Hot Springs. The vertical columns of pentagonal-shaped blocks of obsidian, rising some 250 feet above the road, present a glistening, mirror-like effect when illumined by the sun. The greater part of this mineral glass is jet black and quite opaque, with streaks of red and yellow. The construction of the roadway was accomplished in a novel manner; great fires were built around the blocks of glass, which, when heated, were suddenly cooled by dashing water upon them, thus shattering them into small fragments. This is probably the only piece of glass road in the world. Obsidian Cliff was "neutral ground" to all the Rocky Mountain Indians, and undoubtedly as sacred to the various hostile tribes as the far-famed Pipestone county of Minnesota. Chips of obsidian, and specimens of partly finished arrow heads of obsidian, are found throughout the Park, generally at places occupied by the Indians as summer camps.

About 4½ miles from Norris, **Roaring Mountain** is seen steaming from countless openings in its furrowed sides. Its ashen color and the muffled sound of escaping steam, less audible now than in the past, make this sight

one to be long remembered. Near the roadside at the base of the mountain are greenish, milky pools fed by rivulets of sulphur water from the springs.

Twin Lakes, about four miles from Norris, are remarkable for their beautiful colors. Although situated adjacent to each other they are of decidedly different hues.

The next object of interest is the **Frying Pan,** a basin fifteen feet across, completely filled with little hot springs, or steam vents, which are constantly in a state of violent agitation.

The **Norris Ranger Station** is situated on the far bank of the Gibbon river a short distance north of **Norris Junction (NJ).**

Norris Geyser Basin was formerly called "Gibbon Geyser Basin," but on account of the extensive work of exploration done by Colonel P. W. Norris while he was Superintendent of the Park (1877 to 1882), its name was changed to Norris Geyser Basin.

Geysers at Norris Basin	Max. Height	Duration	Intervals of Eruption
Constant.....	35 ft.	5-15 sec.	20-55 sec.
Echinus.....	30 ft.	3 min.	45 min.
Minute Man.....	15 ft.	15-30 sec.	1 to 3 min.
Monarch.....	125 ft.	6 min.	Irregular
New Crater.....	20 ft.	1-4 min.	2-5 min.
Whirligig.....	15 ft.	10 sec.	Irregular

Congress Pool.—The first sight that attracts the visitor is this immense boiling spring close to the road, on the left as one enters the basin. For many years it was only an opening in the rocks from which a great quantity of steam was constantly escaping, the roaring of which could be heard for miles. During the winter of 1893 the "Steam Vent" ceased and the Congress Pool formed.

To the left of the board walk are **Opal Springs,** the **Iris Pool,** and the **Grindstone,** all hot, boiling pools.

The **Constant Geyser** has a basin twenty-four feet across, out of which displays take place with marked regularity every thirty seconds; a remarkable geyser.

CONSTANT GEYSER, NORRIS GEYSER BASIN 10083

A few feet to the south is a similar basin, the crater of the **Whirligig,** which plays quite like the Constant, but not so frequently.

The **Mud Geyser** is passed on the way to the Valentine and Black Growler. Some seasons this geyser erupts with great violence, displays frequently occurring about sixty feet high.

Black Growler Steam Vent attracts much attention; it roars constantly and emits great volumes of steam. The deposit around the crater is quite black in places. The vent a few yards north of the Black Growler is known as the **Hurricane;** it is quite similar but not so violent as the former.

Situated east of the roadway is the **Bath Tub.** It has a well-formed basin, and while it does not erupt, it is in constant agitation.

Emerald Pool is seen next; a large, quiescent lake of boiling hot water with a greenish tinge, situated south of the Bath Tub.

New Crater Geyser.—This geyser is about 500 feet southeast of Emerald Pool, surrounded by huge blocks of dark yellow rock. It came into prominence during

NATIONAL PARK SERVICE MOTORCYCLE RANGER 19080

the fall of 1891, when quite a commotion, not unlike an earthquake, was observed. When it burst forth a great volume of water was forced out, flooding the ravine leading to the valley below. Since then it has settled down to ordinary eruptions, about every three minutes. The rock-covered crater prevents the discharge from attaining any great height.

Monarch Geyser is situated at the base of the hill, nearly surrounded by a bluff of brilliantly colored rocks, upon the level of the plateau about 1,000 feet east of the roadway. The crater consists of two oblong openings, the larger of which is twenty feet long and three feet wide. Eruptions of the Monarch occur without warning, and consist of a series of explosions in which columns of water are thrown 100 feet high. The intervals between eruptions are about six hours.

Fearless Geyser, situated 500 feet south of the Minute Man Geyser, throws jets of water in every direction during eruptions. Norris is the newest geyser basin in

NATIONAL PARK SERVICE SNOWSHOE RANGERS CARRY PACKS WEIGHING FORTY-FIVE POUNDS, CONTAINING BEDDING, UTENSILS AND RATIONS FOR THREE WEEKS. 17414

the Park, and probably the one most rapidly changing. One cannot predict a season in advance whether any one of its geysers will be doubly active the coming summer, or become entirely inactive.

The **Minute Man Geyser** is interesting on account of its regularity, and the fact that most of the water thrown out flows back into the crater after the eruption. Its crater is small, and appears to have been originally only a fissure in the rock.

Three miles from Norris Basin the road enters **Elk Park**, a beautiful valley surrounded by heavily-timbered hills.

Chocolate Spring, an unique hot spring has built a cone of rich chocolate color across the river from the road.

At the northern entrance to Gibbon Canyon on the opposite side of the river a thousand feet above the road is Mount Schurz, on the summit of which is the **Monument Geyser** Basin. Unless one is inclined to scientific observation, a climb up the steep trail to this

NATIONAL PARK SERVICE MOUNTED RANGER 19079

basin is hardly justified. A dozen or so crumbling geyser cones, some steaming and rumbling, others apparently extinct, constitute its total attractiveness.

Gibbon Canyon.—The roadway enters Gibbon Canyon on the east side of the river, which it follows, as nearly as practicable, for three or four miles, shadowed by precipitous cliffs, in places a thousand feet high.

Beryl Spring is attractive and deserves particular notice, being the largest boiling spring in the Gibbon canyon, and the hottest one in the park. It is fifteen feet across, and is close by the roadside, about a mile from the entrance to the canyon.

Gibbon Falls, whose waters tumble in a foamy torrent down a steep cascade on one side, and on the other, flow in a thin, shining ribbon of silvery spray from a height of over eighty feet, is next seen.

(For continuation skip next four paragraphs.)

TOUR OF THE PARK
FROM THE WESTERN ENTRANCE

West Yellowstone Station, Union Pacific System, and West Yellowstone, Montana, are just outside of the park at the western boundary. The Yellowstone Park Transportation Co. operates a line of automobile stages to all points within the Park and to and from all entrances in connection with the Yellowstone Park Hotels and Camps.

Christmas Tree Park is about three miles wide where the road crosses it. The government engineers constructed an ideal roadway here, which has a bed of crushed rock and an oiled surface for several miles.

The Rainbow and Loch Leven Trout, of the Madison River have made this section of the park famous. It is not uncommon for an expert angler to land a six-pound rainbow trout in this vicinity, a sport to be fully appreci-

WEST YELLOWSTONE STATION, UNION PACIFIC SYSTEM 17293

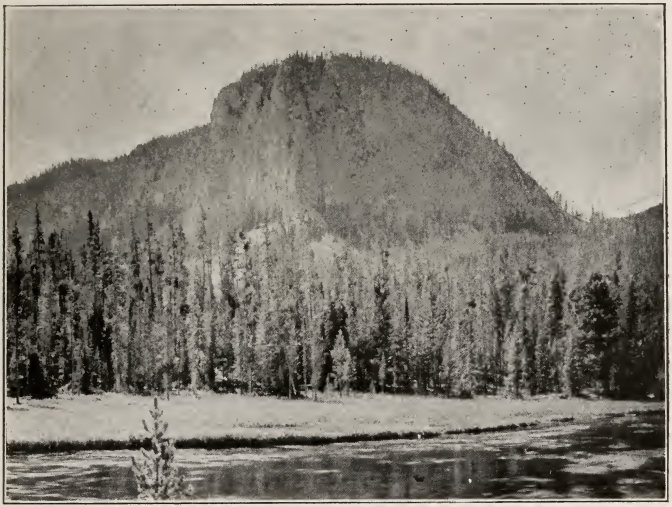
CHRISTMAS TREE PARK, WESTERN ENTRANCE 16211

ated only by experience. The United States Bureau of Fisheries' work in the Yellowstone reserve is to be commended, many ideal trout streams having been destitute of fish life before being stocked.

Mt. Haynes, a rugged escarpment of lava rock rising several hundred feet high from the water's edge on the south side of the Madison Canyon, was named in honor of the late Frank Jay Haynes who devoted forty years of his life in the development of the park (See Historical Section).

National Park Mountain is at the confluence of the Gibbon and Firehole rivers. At this point in 1870 the famous Washburn expedition, while in camp, resolved to direct their efforts towards having the present Yellowstone Park set aside as a National Park (See "Discovery of Yellowstone Park, 1870," by N. P. Langford).

Cascades of the Firehole.—Here a short halt is usually made so that these beautiful cascades may be viewed from different points. Below the upper cascades the river is confined in a narrow gorge until it reaches the main falls. The Firehole River owes a large



MOUNT HAYNES, MADISON CANYON 16220

part of its flow to the immense drainage from the geyser basins, and in many places the water is warm; in spite of this fact, however, trout abound in its pools all the way from Madison Lake, its source, to these cascades.

The **Fountain Ranger Station,** 3½ miles beyond the Firehole Cascades, is at the junction of the main road, and the cut-off road from Excelsior Geyser.

Nez Perce Creek, made famous by the Nez Perce Indians headed by Chief Joseph on their memorable raid through the park in 1877, is crossed near Lower Basin.

Lower Geyser Basin is a comparatively wide valley, embracing an area of thirty or forty square miles. In this valley Dr. Hayden, in his official survey of the park region, has catalogued 693 hot springs. The chief attractions here are the Fountain and Great Fountain Geysers, the Mammoth Paint Pots, Clepsydra Geyser and Firehole Lake.

Fountain Geyser, about 2,000 feet south of the old hotel, occupies a mound, built up by its own deposit over an area of several acres.

This geyser erupts about every two hours. When both the pool and the crater are full of water to the rim, it is probable that an eruption will soon take place. Immediately before action the water falls from twelve to eighteen inches below the crater rim, from which point it spouts gradually until the climax is reached.

In July, 1899, the Fountain Geyser ceased operations and remained inactive until October, when it resumed its usual displays. In the meantime an immense geyser broke out in the large pool north of the Fountain. Its eruptions were of great force, quite irregular, but equal to those of Old Faithful, and continuing, at times, fully an hour.

In July, 1909, it abandoned its crater for the one adjoining and threw out jagged masses of geyserite more than 200 feet. The water was muddy and full of rock fragments for many hours; and as late as September large pieces of rock were thrown out during the more violent eruptions.

For two days preceding the breaking out of this geyser in its new place, much disturbance was noted; loud rumblings were heard and the thumping of the entombed steam and water, gaining in violence each hour, alarmed even those most used to the strange phenomena of the geyser region. During the remainder of the season of 1909 the Fountain Geyser played much higher than before, like a stream through a smaller nozzle, but its eruptions were less regular.

Geysers at Lower Basin	Max. Height	Duration	Intervals of Eruption
Fountain	75 ft.	10 min.	About 2 hours
Great Fountain....	150 ft.	45-60 min.	8 to 12 hours
At Midway Basin..			
Excelsior	300 ft.	Variable	1 to 4 hours. Ceased to play in 1888

MAMMOTH PAINT POTS 13009

Clepsydra Geyser some fifty feet west from the Fountain, has developed into an active geyser of no small eruptive power.

Mammoth Paint Pots.—This remarkable mud caldron has a basin 40x60 feet in size with a mud rim which is from four to five feet high. In this basin is a mass of fine, whitish mud which is in a state of constant agitation. It resembles a boiling pot of paint with numerous points of ebullition. There is a continuous bubbling up of mud, which, rising in hemispherical masses, cones, rings and jets, produces sounds like a whispered "plop-plop."

Great Fountain Geyser is about two miles south of the old hotel and one mile east of the main road. The description by C. W. Cook and David E. Folsom, who witnessed a display October 1, 1869, faithfully portrays its present exhibitions:

"The hole through which the water was discharged was ten feet in diameter, and was situated in the center of a large circular shallow basin into which the water fell. There was a stiff breeze blowing at the time, and by going to the windward side and carefully picking our way over convenient stones we were enabled to reach the edge of the hole. At that moment the escaping steam was causing the water to

EXCELSIOR GEYSER, 300 FEET. CEASED TO PLAY IN 1888 10094

boil up in a fountain five or six feet high. It stopped in an instant, and commenced settling down—twenty, thirty, forty feet—until we concluded that the bottom had fallen out, but the next instant, without any warning, it came rushing up and shot into the air at least eighty feet, causing us to stampede. It continued to spout at intervals of a few moments for some time, but finally subsided."

Many interesting and curious sights in the vicinity of the Great Fountain should be visited. The "White Dome," "Surprise," **Firehole Lake,** "Mushroom," and **Buffalo Spring** are the most prominent. The last was discovered in 1869 by Cook and Folsom who described it in these words:

"In one of these springs we saw the whitened skeleton of a mountain buffalo that had probably fallen in accidentally. No king was ever more magnificently entombed than this monarch of the hills in his sepulchre in the wilderness."

Midway Geyser Basin is the upper portion of the Lower Basin, and is about midway between the Upper and Lower Geyser Basins.

Excelsior Geyser.—"Early explorers in this locality discovered, in 1871," says Dr. Peale, "on the west bank of Firehole River, an immense pit of rather irregular outline, 330 feet in length by 200 feet in width at the widest part. The water is of a deep blue tint, and is intensely agitated all the time, dense clouds of steam constantly ascending from it. It is only when the breeze wafts this aside that the surface of the water, which is fifteen or twenty feet below the level surrounding, can be seen. The walls on three sides are perpendicular, cliff-like, and in places overhang, having been worn away on the other."

This pit was known as "Hell's Half Acre," until 1881, when Colonel P. W. Norris on account of the tremendous upheavals observed called it "Excelsior." Its eruptions that year began after the tourist season. Colonel Norris witnessed thirty eruptions, varying from 75 to 250 feet in height. The intervals of eruptions during 1888 were at first about every hour and fifteen minutes, lessening towards the latter part of the season to two hours. Immediately preceding each eruption a violent upheaval occurred, raising the entire body of water nearly fifty feet, then instantly one or two, and sometimes three, terrific explosions would occur, followed closely by the shooting upwards of columns of water, and oftentimes masses of the rocky formation, to a height of 200 to 250 feet. The tons of rock which were thus hurled into the Firehole River from the rim of the crater allowed a considerable increase in the flow of water, which probably accounts for its cessation in 1888, since which year it has been inactive.

Turquoise Spring, about 150 feet north of Excelsior, is a silent pool, about 100 feet in diameter, and remarkable for its beautiful blue transparent water.

Prismatic Lake is the largest and one of the most beautiful springs in the Park region. Over its central pit or bowl, the water is of a deep blue color, blending green towards the edge, while in the shallower portions it has a yellow tint gradually blending into orange at its edge. The water flowing off in every direction, with constant wave-like pulsations over the scalloped and slightly

raised rim of the lake, has formed a succession of terraces, each a few inches in height, down the slopes of the mound. It is impossible to exaggerate the delicacy and richness of the coloring. The temperature of the water is about 146 degrees Fahrenheit.

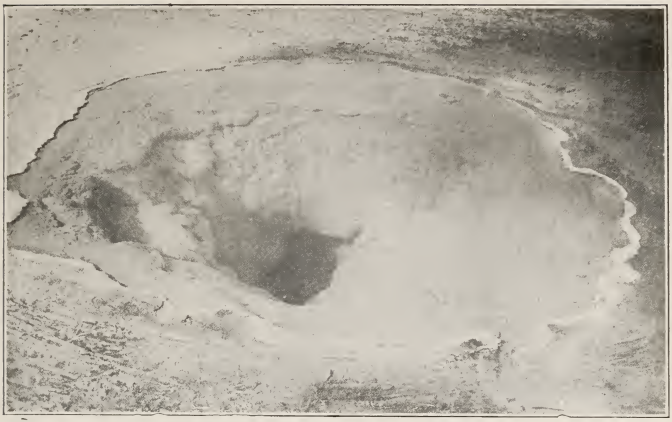
Biscuit Basin is on the west side of Firehole River about a mile below Riverside Bridge. In Biscuit Basin is **Sapphire Pool,** whose highly ornamented margin suggested its odd name. Hundreds of small biscuit-like knobs surround the spring. A few feet to the west is

Jewel Geyser, whose eruptions occur with the remarkable frequency of from three to five minutes, throwing jets of water to a height of about forty feet. West 500 feet are the **Black Pearl** and **Silver Globe.** The former has a beautiful basin, studded thickly with black pearls, each about a quarter of an inch in size. A curious feature of this little spouter, is the fact that its formation surrounds the roots and stump of a tree, completely incrusting it with its black ornamentations.

The Silver Globe derives its name from the constant rising to its surface of large, silvery bubbles of gas, which, of course, immediately disappear on reaching the air.

Artemisia Geyser is sixty feet in diameter and generally very little agitated, merely overflowing. The surrounding formation, quite unlike that of any other geyser is as hard as flint, and of an olive-green color. Although for the most part very quiescent, this spring has occasional pulsations in the nature of eruptions, at which times large quantities of water are forced out, flooding the formation. These eruptions occur at intervals of twelve to twenty-four hours.

Morning Glory Spring is passed just before coming to the Riverside Bridge. The symmetrical shape and funnel-like crater whose walls are delicately colored, account for its appropriate name. At the surface the diameter is 23 feet and the temperature 100 degrees F., and apparent depth 29 feet.



MORNING GLORY SPRING, CLOSE-UP 13076

Upper Geyser Basin contains twenty-six geysers and upwards of 400 hot springs. The Firehole River drains it, centrally; its shelving banks are thickly pitted with steaming hot springs and studded with mounds and cones of geyserite. Here, grouped within the narrow space of perhaps a square mile are the grandest and mightiest geysers known to man; and silent pools of scalding, meteoric water that for beauty of formation and delicacy of coloring are marvels. The surface of the basin consists, for the most part, of a succession of gentle undulations, each crowned with a geyser-cone or hot-spring vent and covered with layers of silicious sinter that give it a grayish-white, sepulchral hue. Clouds of vapor hang shroud-like above it; the earth trembles and is filled with strange rumblings, the air is heavy with sulphurous fumes, and vegetable life is extinct. In a paper read before the Cardiff (Wales) Naturalists' Society, Mr. Charles T. Whitmell said:

"Nowhere else, I believe, can be seen, on so grand a scale, such clear evidence of dying volcanic action. We seem to witness the death throes of some great American Enceladus. Could Dante have seen this region, he might have added another terror to his Inferno."

The **Riverside Geyser,** which is on the east bank of the Firehole River a few feet above the new steel bridge, erupts every six or seven hours, obliquely across the river; sometimes eruptions take place as frequently as every five and one-half hours for a period of several days.

The Riverside formation is made up of two craters on a chimney-like mound of silicious deposit; the lower, or main crater, overflows continuously for about an hour before each eruption; jets of water are thrown out about twenty minutes before displays, from the upper crater. The maximum height of the Riverside is one hundred feet; this is maintained for eight minutes, followed by the characteristic steam-period lasting several minutes.

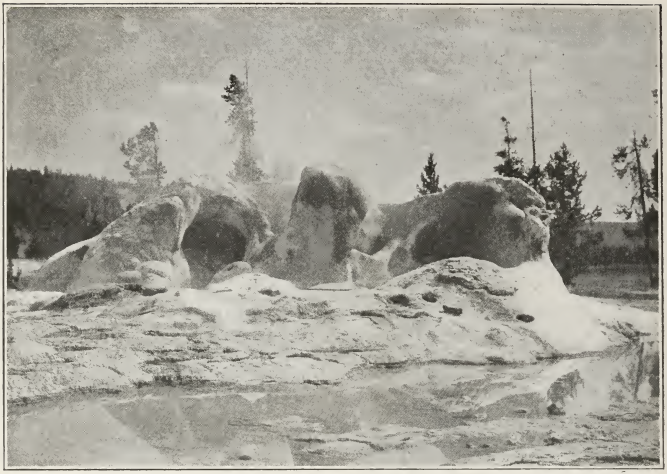
RIVERSIDE GEYSER, 100 FEET 16065

The next feature of prominence is the **Grotto Geyser** which has the most extraordinary formation of any geyser in the park; it received this appropriate name in 1870 from the Washburn party. Eruptions vary in interval from two to eight hours, and are about thirty feet high, lasting from fifteen minutes to eight hours. Occasionally the Grotto ceases and the **Rocket,** an isolated cone a few feet north of the Grotto, plays to a height of fifty feet for two or three minutes; then the Grotto resumes. The pool near the road north of the Rocket is called the Spa (a mineral spring); it has not been observed to erupt, but empties and fills at intervals indicating a probable relation to some distant geyser.

Geysers at Upper Geyser Basin	Maximum Height	Duration	Intervals
Artemisia.....	50 ft.	10 min.	24-30 hrs.
Beehive.....	200 ft.	8 min.	8 hrs. to 8 days
Castle.....	75 ft.	30 min.	Irregular
Cub (Big)....	30 ft.	8 min.	With Lioness
Cub (Little)..	6 ft.	17 min.	1 to 2 hrs.
Daisy.....	70 ft.	3 min.	1½ hrs. to 1 hr. and 50 min.
Economic.....	20 ft.	10 sec.	Seldom
Giant.....	250 ft.	1 hr.	6-14 days
Giantess.....	100 ft.	12-36 hrs.	10-20 days
Grand.....	200 ft.	15-30 min.	10-12 hrs.
Grotto.....	30 ft.	15 min.-8 hrs.	2-8 hrs.
Jewel.....	20 ft.	1 min.	5 min.
Lion.....	60 ft.	3 min.	2-8 hrs.
Lioness.....	100 ft.	10 min.	Irregular
Lone Star.....	50 ft.	10 min.	3 hrs.
Mortar.....	30 ft.	5 min.	Irregular
Oblong.....	20 ft.	7 min.	8-15 hrs.
Old Faithful..	120-170 ft.	4 min.	65-80 min.
Riverside.....	100 ft.	15 min.	6-7 hrs.
Rocket.....	50 ft.	2-3 min.	Irregular
Sawmill.....	35 ft.	1-3 hrs.	Irregular
Spasmodic....	4 ft.	20-60 min.	Irregular
Splendid.....	200 ft.	.....	Inactive since 1892
Sponge.....	4 ft.	15 sec.	1¼ min.
Turban.....	40 ft.	10 min.-3 hrs.	With Grand and frequently

The **Giant Geyser**, about five hundred feet southeast of the Grotto, is the **highest geyser in the world**; it plays two hundred and fifty feet, for a period of one and one-half hours, every six to fourteen days. Its maximum height, however, is maintained only during the first twenty minutes. The Giant Geyser cone is ten feet high, and has one side partly broken off, exposing its channel, which is four feet across.

On the same deposit are three boiling cauldrons—the **Catfish, Bijou** and **Mastiff**, all of minor importance. Near these is a sign marked "Indicator," but it is very uncertain if activity of the Giant is ever foretold by activity of these smaller basins. In some cases, however, geysers do have true indicators, notably the Beehive.



GROTTO GEYSER FORMATION 14029

The **Daisy Geyser**, located near the **White Pyramid**, is a very pretty and reliable geyser. The character of its eruptions which occur every 70 to 80 minutes, are very like the **Splendid Geyser** which ceased to play about the time the Daisy broke out in 1892. The Daisy plays seventy-five feet high; duration, three minutes. Across the road from the Daisy is **Bonita Pool**, which acts as its indicator. The **Brilliant** is a beautiful, blue, quiescent, hot spring. Near it is the **Comet**, which boils up at intervals, and has built up a small cone of geyserite.

Punch Bowl Spring.—The road leading westward from the Splendid toward Black Sand and Sunset Basins passes the Punch Bowl, by far the handsomest spring of its class in the geyser region. Situated on the summit of a mound some five feet above the general level, it is about ten feet in diameter, with a glittering rim of colored formation eighteen inches in height. A small, cave-like opening on the east side of the mound appears to

HANDKERCHIEF POOL 20136

be lined with satin of the rarest beauty and texture. Early visitors to the Park during the seasons of 1873 and 1875 speak of this spring as being an active geyser, and during 1888 similar reports gained currency. Nothing, however, is definitely known as to the correctness of these reports.

Black Sand Spring and Specimen Lake.—Dr. Peale's description of Black Sand Spring is interestingly comprehensive, and is as follows:

"This is one of the most beautiful springs in the Upper Basin. It has a delicate rim, with toadstool-like masses around it. The basin slopes rather gently toward a central aperture that, to the eye, appears to have no bottom. The water in the spring has a delicate turquoise tint, and as the breeze sweeps across its surface, dispelling the steam, the effect of the ripple of the water is very beautiful. The sloping sides are covered with a light brown crust; sometimes it is rather a cream color. The funnel is about forty feet in diameter, while the entire space covered by the spring is about 55x60 feet, outside the rim of which is a border of pitch-stone (obsidian) sand or gravel sloping twenty-five feet. From its west side flows a considerable stream, forming a most beautiful channel, in which the coloring presents a remarkable variety of shades; the extremely delicate pinks are mingled with equally delicate tints of saffron and yellow, and here and there shades of green."

The overflow from this spring spreads out over a large area, called **Specimen Lake,** which deserves more than passing notice. Absorption of silica has destroyed many trees in the vicinity, the dry, lifeless trunks still standing.

Sunset Lake, reached by a foot-bridge over Iron Creek, is a beautifully colored pool which steams constantly. It is larger than **Rainbow Pool,** and situated a few steps north of it. Several yards north at the edge of the timber is the most beautiful pool in the Upper Basin—**Emerald Pool**; its deep emerald color blends to yellow toward the edge, and the formation immediately around it is a rich red. This pool, though hot, never boils, and is slightly overflowing. Across the river from Emerald Pool is **Green Spring.**

Handkerchief Pool is but a few feet from Rainbow Pool, a small basin with a funnel-shaped opening. A handkerchief placed in the water near the edge will be drawn downward and out of sight by convection currents in the water, and in a few minutes will reappear.

Cliff Spring usually is boiling violently; and though credited by some with having occasional eruptions, it is usually considered to be only a spring. It is close to the foot-bridge on the west side of the river.

Whistle Geyser, near the road leading toward Old Faithful Inn, performs only at great intervals; but when the great rush of steam commences, as it does several times each season, a whistle-like roar is produced which is audible for half a mile and lasts several minutes.

The **Three Sisters** springs, while attractive, are so like a hundred other boiling pools that they are usually passed without a halt. They are situated in sight of Old Faithful Inn and not far from the Castle Geyser (on the road leading direct from the Riverside Geyser to the hotel).

The **Castle Geyser** is at once recognized by its large cone resembling "an old feudal castle partially in ruins" (Doane). The great amount of deposit, perhaps 100 feet in diameter at its base, indicates that it is the oldest

CASTLE GEYSER IN STEAM PERIOD, 75 FEET 11742

geyser in the Park. The orifice of the geyser tube in the top of the cone is about three feet in diameter, quite round, and is lined with a bright orange color. Eruptions are quite irregular. Several times each season it has eruptions of an unusual character, in which its columns of water are thrown to twice their usual height. A violently boiling spring situated near the base of its cone, which used to be a favorite spot for "campers-out" in earlier days, is ten feet across, has an apparent depth of 52 feet and a temperature of 199 degrees F.

Castle Well is a large, crested spring 100 feet north of the Castle. This spring is twenty feet in diameter and overflows on two sides.

The **Hamilton Store,** acquired in 1915 by C. A. Hamilton, carries a full line of merchandise, supplies, souvenirs, trophies, curios, oil and gasoline—a large building patterned in architecture after Old Faithful Inn.

OLD FAITHFUL INN AND AUTOMOBILE STAGES 19025

Old Faithful Inn (alt. 7,394 feet), the most extensive log structure yet devised by man, with every convenience and luxury of the modern hotel, is the latest triumph in utilizing primitive material in construction. The rough blocks of stone of its foundation appear as natural as when found at the base of the cliffs of the mountains.

The center of the building, rising eight stories high, is surmounted by the lookout, affording a splendid view of the geyser basin. From half a dozen golden-topped flagstaffs float the emblems of various nations. At night, by a powerful searchlight, one may see scores of steaming craters and pools and any of several active geysers. The illumination of Old Faithful Geyser in action is a sight never to be forgotten. The Old Faithful Inn was first opened to the public for the season of 1904.

GIANT GEYSER, 250 FEET 13063
ERUPTS HIGHER THAN ANY OTHER GEYSER IN THE WORLD

OLD FAITHFUL INN BED ROOM 10165

OLD FAITHFUL GEYSER BATHS 10202

HAMILTON STORE, OLD FAITHFUL 22670

Old Faithful Geyser.—Every seventy minutes (with rarely a variation of five minutes) day and night, summer and winter, this wonderful manifestation of nature gives its exhibition. This geyser is one of the most popular in the Park, because of the remarkable regularity with which its eruptions occur, and the excellent opportunities afforded for observation. Eruptions by moonlight, at sunrise or sunset, in a storm or with clear weather with their varied effects equally command the attention of the visitor.

Its eruptions begin with a few spasmodic spurts, during which considerable water is thrown out; these are followed by a column of hot water two feet in diameter which is projected upward 125 to 150 feet, which height is maintained for about three minutes.

Haynes Picture Shop, operated by the official photographer of Yellowstone Park, has a complete line of photographs, prints, lantern slides, photographic supplies, post cards, cameras and films.

Artificial Geyser.—To demonstate the theory of geyser action, J. E. Haynes built a miniature geyser

HAYNES PICTURE SHOP, OLD FAITHFUL 22606

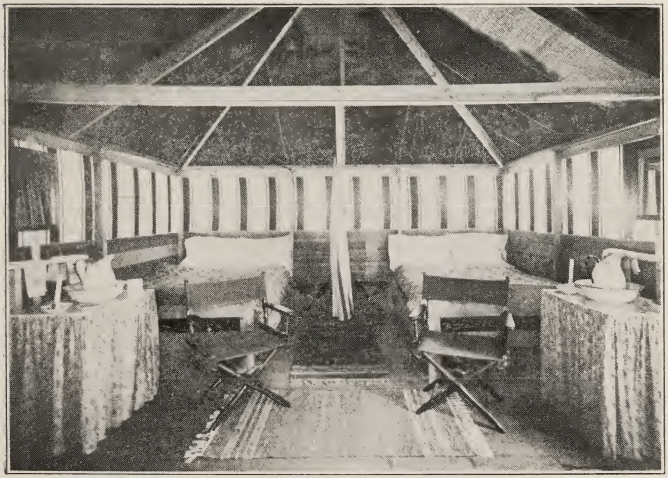
model which produces eruptions three feet high, at intervals of one minute. This model is on exhibition at the Haynes Picture Shop in front of Old Faithful Inn. In 1915 he built the model for the Interior Department, in their laboratories in Washington, D. C.

Old Faithful Ranger Station and Community Center stands in a group of young pines at the right of the road just beyond Old Faithful Inn and directly south of Old Faithful Geyser. This station is the headquarters of the rangers who protect Upper Geyser Basin. It is also an Information Office of the National Park Service. The **Public Automobile Camp** is in the forest directly behind the Ranger Station.

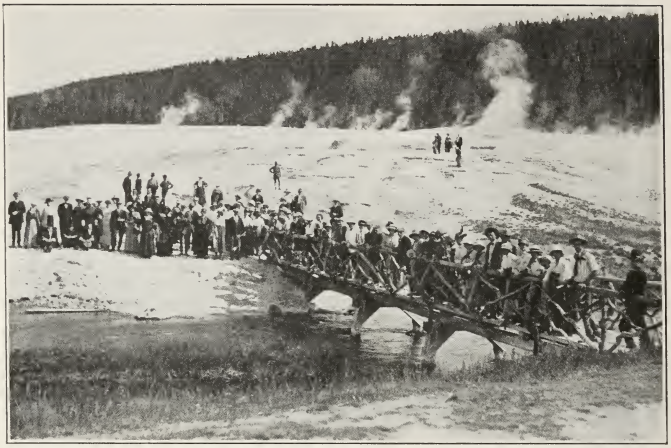
Old Faithful Camp is well situated just beyond Old Faithful Geyser. In addition to guests patronizing the camps on their entire tour, the occasional guests, motorists, horsebackers and hikers may obtain meals and lodgings at any of these camps.

The **Beehive Geyser** is situated in **Geyser Hill** across the river. Its symmetrical cone, shaped like an

OLD FAITHFUL CAMP AND AUTOMOBILE STAGES 18322



OLD FAITHFUL CAMP, TWO-ROOM TENT 15069



TOURISTS AND GEYSER HILL, OLD FAITHFUL 15078

old-fashioned beehive, is four feet high and three feet across. The Beehive plays out of its nozzle-like opening to the amazing height of two hundred feet.

Its eruptions are foretold by the spouting of its indicator, an inconspicuous fissure in the formation ten feet north of the cone.

A few feet east of the Beehive cone at the top of the river bank, is the **Cascade Geyser,** now but a quiet spring. Down at the river's edge is the **Sputterer,** which discharges at intervals directly into the river. On the opposite bank is the **Chinaman Geyser,** which was named in memory of that Oriental who established a laundry here, put in the clothes and soap, and was annihilated, so the story goes, by the violent eruption which ensued. It is a remarkable fact that a bar or two of soap will cause practically any geyser to play within a few minutes. The practice of causing eruptions in this manner became so common a few years ago that the govern-

CHARLEY MOORE'S TRAIL RIDERS AT OLD FAITHFUL 12436

ment put a stop to it, as it was feared the geysers would be injured.

The **Giantess Geyser** occupies the most prominent position on Geyser Hill. Its displays attain the height of one hundred feet, and are accompanied by shocks and tremors not unlike earthquakes. After the thirty-foot crater of the Giantess is emptied, a steam-period ensues, the entire eruption lasting from twelve to twenty-four hours. During 1911 the intervals between eruptions varied from four to twelve days; while a few years ago the Giantess played only every three to four weeks. This accurate record disproves, in this case at least, that the geysers are all diminishing in eruptive violence and frequency. It is now pretty generally believed that, while this thermal activity as a whole is decreasing, a century brings only an imperceptible change. The late N. P. Langford, writer and explorer, who visited the Park with the Washburn party in 1870, stated in 1910, while at the Upper Basin, that he saw absolutely no perceptible change in Old Faithful Geyser, or any of the others.

On the prominence with the Giantess, are two cauldrons, the **Teakettle** and the **Vault**; the latter is a geyser which plays eight feet high twenty-four hours before the Giantess. **Topaz Pool** is at the base of the Giantess mound.

SPONGE GEYSER 16337

The **Pump,** at the foot of the Giantess mound in the direction of Sponge Geyser, is a hole eighteen inches across out of which comes a thumping sound resembling an hydraulic ram at work.

Sponge Geyser, a short distance east of the Giantess, is remarkable on account of the appearance of its cone, a flinty formation, porous and yellow like a sponge. The eruptions occur a minute and a quarter apart and are about four feet high.

Doublet Pool, marked "Dangerous" on the signboard, is a good example of the overhanging crust formation. No doubt in time it will be practically all covered over; although this sinter formation, characteristic of the entire Upper Basin, forms very slowly.

Beach Spring, north of the Doublet, has a central opening surrounded by a rather wide, submerged beach, which is symmetrical and practically flat.

The **Ear** is on the summit of a mound between the Beach and the Lion group. Curiously enough it not only resembles an ear in shape, but the lobe is pierced and the

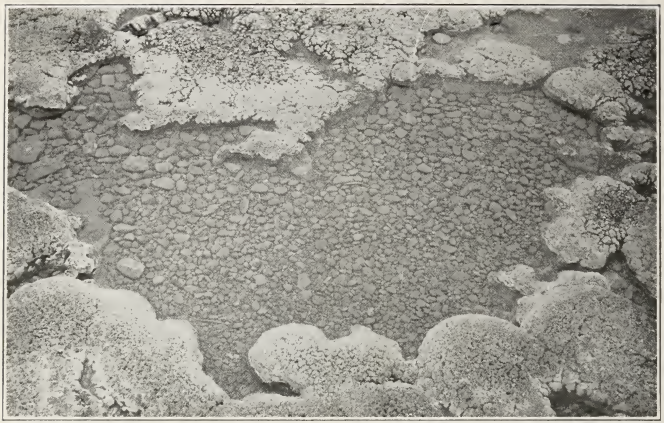
LION GEYSER, 60 FEET 19082

earring is a tiny geyser. It is here that messages are transmitted, so the story goes, to regions below.

The **Lion Geyser,** with the Lioness and two Cubs, occupies a conspicuous mound west of the Giantess and in sight of the hotel.

The **Lioness Geyser** has not been observed to play at all some seasons, while during other seasons eruptions have been noted at intervals of about fifteen days. In 1903 the Lion, Lioness and both Cubs, played simultaneously one day for a large party of tourists. The larger Cub plays with the Lioness to a height of thirty feet; the smaller one plays frequently, but only a few feet high.

A path leads from the Lion group past the **Liberty Pool** to the **Sawmill Geyser,** which gets its name from the peculiar noise during eruptions; the maximum height of this geyser is forty feet, and intervals three to four hours. Its indicator is a few feet southeast; both the indicator and the Sawmill start together, and very suddenly, throwing water in every direction.



GEYSER EGGS NEAR SAWMILL GEYSER 14016

The **Grand Geyser** is one of the finest in the park. It discharges forked columns of water to a height of two hundred feet in a series of eruptions eclipsing Old Faithful and occurring nearly every day.

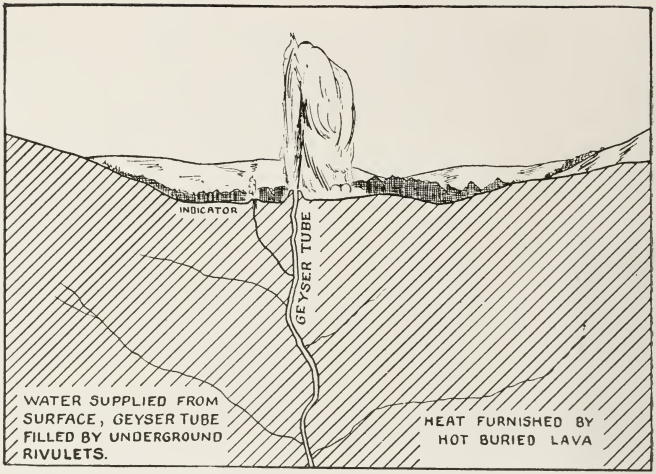
Adjacent to the Grand Geyser crater is the **Turban Geyser,** which plays out of a small fissure next to the main crater of the Turban. When quiet, the larger crater often presents the appearance, in its interior, of a dancing flame, caused by the light playing on the bubbles of gas which constantly arise therefrom. Many of the early explorers really believed that internal fires were visible here. Firehole Lake, at the Lower Basin, also affords a good example of this phenomena. The Turban plays twenty-five feet high and at an angle, eruptions lasting an hour or more, and occurring with the Grand Geyser and at other times.

The fittingly-named **Economic Geyser** is a few rods north of the Turban; after its eruptions all the water flows back into the crater and disappears. The Economic plays only fifteen or twenty feet high, but in its general form resembles Old Faithful.

OBLONG GEYSER CRATER 10100

Beauty Spring, a large silent pool, is remarkable for its coloring and its highly ornamented margin. **Chromatic Pool,** nearby, is a good example of colored geyser formation; a rust color predominates in various shades from yellow to richest brown, blending into green and delicate pinks. The mushroom-like algous growths seen in some of the bordering pools are of interest to the scientist who knows what an important part the algae have in the rate and manner of deposition of silica, and on account of their peculiar forms and colors.

The **Oblong Geyser** is on the opposite side of the Firehole River from Chromatic Pool. Its crater is remarkable in that no better example of interior geyser structure is seen in the entire park. Large globular masses of tan colored geyserite form the rim; the water is a delicate blue color and of such transparency that the two fissures in the bottom of the crater are plainly seen. Pre-



GEOLOGICAL PROFILE, TYPICAL GEYSER 13029

ceding eruptions the crater fills to the shore line and boils for fifteen minutes.

GEOLOGICAL.—A geyser may be defined as a periodically erupting hot spring, its water is not volcanic but simply hot meteoric water; so a geyser is not a volcano ejecting water but a true spring. Were the heat sufficient and the tube long enough all hot springs would erupt.

Sounds like cannonading are heard directly preceding a geyser eruption; this is caused by the collapse of steam bubbles from the hot region below rising through the cooler strata of water. The surface of the pool, from which the geyser plays, bulges and overflows, and sometimes jets of water are thrown upward preceding activity.

The famous scientist, R. W. Bunsen, after making a careful study of geyser action by extensive observation and experiment, advanced the following authoritative explanation:

It is well known that pressure in water (being due to gravity) increases with the depth; and furthermore, that

ISA LAKE, CONTINENTAL DIVIDE 13017

the boiling point rises with the increase in pressure. The geyser tube which extends deep into the earth is filled with water from the higher tracts of land around; the heat is from the buried masses of lava not yet cool, lava being such a great non-conductor and retainer of heat.

The typical geyser eruption may be divided into five stages, namely, (1) the water remains practically stationary after the tube has filled, and becomes steadily hotter, (2) steam bubbles rising through the cooler strata of water, collapse, producing the characteristic premonitory "cannonading," (3) steam forms below in sufficient quantity to cause the surface to overflow, thus the pressure is lessened in all parts of the tube, and (4) the great burst of steam ensuing, ejects all the water from the tube, (5) the steam follows and while the tube is filling for another eruption, there is no activity other than occasional puffs of steam.

From the Upper Basin to Yellowstone Lake the road leads up the Firehole River to

Kepler Cascade, less than two miles distant, whose waters form a series of enchanting falls, aggregating 100 to 150 feet in height.

Lone Star Geyser, off the main road, is visited only as a side trip. Its cone, twelve feet high, has a large central opening and numerous small ones from which water is thrown. The cone is its principal attraction, although the eruptions are at times 75 feet high.

At a point eight miles from Upper Basin is **Norris Pass** through which a trail leads south to Shoshone Lake. **Craig Pass** is one-half mile further.

Isa Lake is next seen; its waters flow to both the Atlantic and Pacific Oceans from the summit of the Continental Divide. **Two Ocean Pond,** a similar lake, is also on the summit of this range a few miles south of Yellowstone Lake.

The **Continental Divide,** altitude 8,240 feet, is crossed twice between the Upper Basin and Yellowstone Lake. It enters the Yellowstone Park near the Western Entrance and passes through the reserve to its southern border forming the water-shed between Yellowstone Lake and the head waters of Snake River.

Shoshone Point affords a most commanding view. It overlooks the country to the south, Shoshone Lake in a beautiful valley, and the Teton Mountains many miles south.

Beyond Shoshone Point the road again crosses the continental divide at an altitude of 8,345 feet.

Shoshone Lake has an area of about 12 square miles, and a very irregular shore line. Shoshone Geyser Basin on the west shore of the Lake has several large geysers and numerous interesting springs. It is reached by trail from Lone Star Geyser.

On a clear day from Shoshone Point may be seen the snow-capped Teton Mountains, fifty miles distant, that

form a portion of the boundary between the states of Wyoming and Idaho, their dizzy heights overtopping all other peaks of the region.

Lake View.—A mile from West Thumb bay one catches the first glimpse of Yellowstone Lake. An interesting paragraph in the diary of C. W. Cook and David E. Folsom written in 1869 describes this view as follows:

"As we were about departing on our homeward trip we ascended the summit of a neighboring hill and took a final look at Yellowstone Lake. Nestled among the forest-crowned hills which bounded our vision lay this inland sea, its crystal waves dancing and sparkling in the sunlight as if laughing with joy for their wild freedom. It is a scene of transcendent beauty which has been viewed by but few white men, and we felt glad to have looked upon it before its primeval solitude should be broken by the crowds of pleasure seekers which at no distant day will throng its shores."

The **Thumb Ranger Station** is situated facing the lake at **West Thumb Junction (WT).**

The **Hamilton Store,** situated at the West Thumb near the ranger station, is the second link in the chain of three Hamilton stores in the park. Merchandise, supplies, souvenirs, pictures and confections may be obtained here.

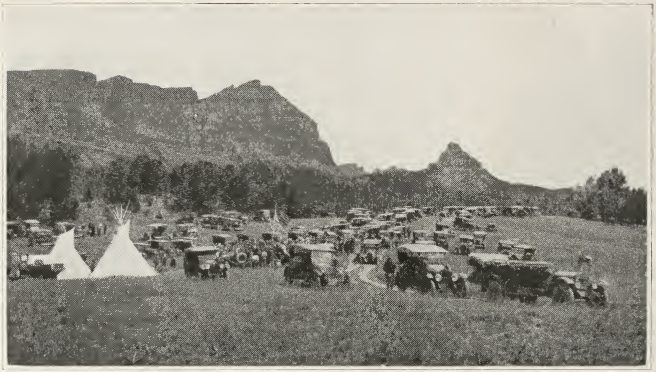
West Thumb Public Camp Grounds are across the road and southeast of the Ranger Station.

(For continuation to Yellowstone Lake see page 89.)

TOUR OF THE PARK

FROM THE SOUTHERN ENTRANCE

Lander, Wyoming, "Where rails end and trails begin," is the western terminus of the Chicago & North Western Railway. The route by automobile over the **Rocky Mountain Highway** from Lander to



DEDICATION CEREMONIES, TWO-GWO-TEE PASS 21185

the Southern Entrance of Yellowstone National Park is spectacular and diversified. Rail passengers may make this trip with the Lander-Yellowstone Park Transportation Company, which operates an established automobile stage line to Moran in Jackson Hole, where they transfer to the automobile stages of the Yellowstone Park Transportation Company for the rest of the journey to and through the park.

From Lander, a modern and progressive town with first class hotel accommodations and located on the banks of the Popo Agie River, the highway takes a northwesterly course through the **Shoshone Indian Reservation,** passing **Fort Washakie** (17.1 miles) then paralleling the picturesque Wind River with its innumerable little trout streams nearly all the way to Bull Lake Creek (37.3 miles). Mountain ranches mark the way. The J. K. Ranch (45.7 miles) where the historic **Crow Heart Butte** looms up to the north, the Circle Ranch (71.1 miles) and the C. M. Ranch near Dubois are among the principal ones.

THE GRAND TETON, ,13747 FEET 10067

Dubois, 83.5 miles northwest of Lander, is walled in by mountains; the Owl Creek Range on the east, Wind River Range on the south, the Teton Mountains on the west, and the Absaroka Range on the north. The automobile stage passengers make this a luncheon stop; and **Two-Gwo-Tee Inn** at Brooks Lake (108.5 miles) for overnight. This Inn was built especially for accommodations of tourists making the trip to the park over the Rocky Mountain Highway from Lander and is a charming spot where the best of fishing can be had and if advantage is taken of stop-over privilege, most interesting pack horse trails may be taken into the mountains.

Two-Gwo-Tee Pass, 116.5 miles, is near the headwaters of the Wind and Green Rivers. It is considered one of the most beautiful crossings of the Rockies, and lies at an elevation of 9,545 feet. Some of the largest living glaciers in the United States may

MOUNT MORAN, 12,100 FT., AND JACKSON LAKE 10002

be seen to the southward. The view of mountain peaks, canyons and wooded parks is most beautiful. The dedication ceremonies opening this southern route to the Yellowstone National Park were held at Two-Gwo-Tee Pass on August 21, 1921 and at which services the Governor of the State, U. S. Senator, Superintendent of Yellowstone Park, Railway representatives, and other notables were present.

From the Pass the highway descends in a westerly direction through romantic scenery to the **Jackson Hole** country, a fertile basin 20 by 50 miles in extent, to Jackson Lake at the foot of the majestic Teton Mountains. All the way the Teton Mountains are in full view and the scenery is inspiring. Automobile stage passengers stop at **Amoretti Inn** near Moran, Wyo., 153.5 miles from Lander, for luncheon. This Inn, charmingly situated, was built especially for tourists via the Lander Gateway. Outlined against the sky to the westward is Mount Moran and the

LEWIS FALL, LEWIS RIVER 19013

Grand Teton, 13,747 feet high at the left, although nine miles away, is plainly visible.

Mount Moran, altitude 12,100 feet, one of the largest peaks of the Teton Range, was named for the great American painter Thomas Moran. In 1917 a party of climbers scaled this mountain as far as the large central glacier for the purpose of determining its extent. Emerson Hough, writer, Huntley Child of the Yellowstone Park Hotel Company, Robert C. Reamer, architect of the Old Faithful Inn and the Grand Canyon Hotel, H. H. Hays, of the Yellowstone Park Camps Company, I. L. Peil, of the Northern Pacific Railway, Charles d'Emery and J. E. Haynes, park photographer, reached the glacier. It was their unamimous verdict that Jackson Lake in its towering mountain setting would soon draw to its shores hun-

WEST THUMB BAY OF YELLOWSTONE LAKE 12766

dreds of recreationists, not alone for the romantic interest, but for its grandeur and picturesqueness, and the opportunities for mountain climbing, fishing and trail riding.

The **Government Dam** recently completed at Moran permits raising the water level of Jackson Lake several feet, regulating the flow of Snake River for irrigation projects along its course. Near the dam is **Sheffield's Lodge,** and a general store, where accommodations and supplies may be had. Moran is reached by highways from Jackson, Wyo., and Victor, Idaho, as well as from Lander (153.5 miles).

The route from Moran to the park boundary at **Snake River Ranger Station** is northward across Pilgrim Creek, Arizona Creek and the Snake River. It is 24.9 miles from Moran to the park, and 23.3 miles from the boundary to the "loop road" of the park at the West Thumb of Yellowstone Lake over a splen-

SPEEDBOAT ADELAIDE, YELLOWSTONE LAKE 22661

did road. A mile beyond the Ranger Station on Crawfish Creek, a hundred yards east of the road, is Moose Fall reached by a footpath on the north side of the stream.

Lewis Falls is six miles further on. It may be viewed from the bridge over the Lewis river. Three miles further is **Lewis Lake,** a beautiful body of water surrounded by forested hills along which the highway runs for quite a distance. The **Continental Divide** is crossed about three miles before coming to the West Thumb, 201.7 miles from Lander, which is on the main "loop road" of the park.

The West Thumb Public Camp Grounds, the Hamilton Store and the **West Thumb Ranger Station** are all in sight of Yellowstone Lake. Near here are several hot springs, geyser cones, paint pots, and fumaroles. The **Lake Shore Geyser** plays at varying intervals several feet high. The **Fishing Cone** named by the Expedition of 1870 has a boiling spring in its center which projects above, and is surrounded by

LAKE HOTEL 20090

the cold water of the lake. This is the famous place where fishermen used to stand after catching trout in the lake, and boil them while still on the hook—a practice now prohibited.

Yellowstone Lake is one of the largest at its elevation, 7,741 feet, in the world. Its shore line is one hundred miles long; and its area 139 square miles. The snow-capped **Absaroka Mountains** rise to altitudes of ten to eleven thousand feet from its eastern shore. Several islands dot the surface of this icy sheet of water; Stevenson and Frank Islands being the largest. Many beautiful views of this lake may be had from the highway on the drive from the West Thumb to the Lake Outlet.

The southern entrance route from Lander has increased steadily in popularity since its opening. The highway has been greatly improved, as have facilities for caring for the needs of travelers. It is this route that President Chester A. Arthur took in 1883 by pack train, with Robert T. Lincoln, Secretary of War,

LAKE HOTEL DINING ROOM 16025

Senator George G. Vest, General P. H. Sheridan, General Anson Steger, Governor Schuyler Crosby of Montana and several other notables, and the late F. Jay Haynes, who made a complete photographic record of the expedition.

From the Thumb the road leads northeast along the shore of Yellowstone Lake.

The **Natural Bridge** is passed 3.2 miles from the Lake Hotel. It spans a small creek and looks quite symmetrical from the lower side. Its abutments are thirty feet apart, and the arch sixty feet high.

The **Lake Hotel,** of Colonial architecture, is one of the system of four large hotels operated by the Yellowstone Park Hotel Company in the park.

In 1923 the large east wing was completed, materially increasing the capacity of the Lake Hotel, and placing it on a par with the Mammoth, Old Faithful and Grand Canyon hotels. The fast increasing patron-

HAMILTON STORE, YELLOWSTONE LAKE 22669

age justifies this enlargement in line with the policy of adequate facilities in the park.

The **Hamilton** Store at the lake outlet a short distance beyond the Lake Hotel was completed in 1922 having been under construction since 1919. This is one of the largest stores in the park. In addition to a general line of merchandise and pictures, this store has for sale a wide assortment of curios from various parts of the world.

The **Lake Public Automobile Camp** lies in the forest back of the store. The **Lake Ranger Station** is situated a short distance beyond Lake Camp.

The **Lake Camp,** of the Yellowstone Park Camps Company, is one of the newest tent cities in the park. It is composed of a large central log building and many separate tents.

The permanent camps operated by this company are at Mammoth Hot Springs, Old Faithful, the Lake, Grand Canyon and in the valley beyond Tower Fall—

LAKE CAMP DINING ROOM 20115

SLEEPING GIANT AT YELLOWSTONE LAKE 22627

LAKE CAMP 22731

"Camp Roosevelt." Many improvements and adequate expansions have been made recently in these camps to keep abreast of their rapidly growing patronage.

In the mountain range on the east side of the lake can be seen the **Sleeping Giant,** formed of several peaks of the Absaroka Range.

(For continuation to Grand Canyon see page 98.)

TOUR OF THE PARK

FROM THE EASTERN ENTRANCE

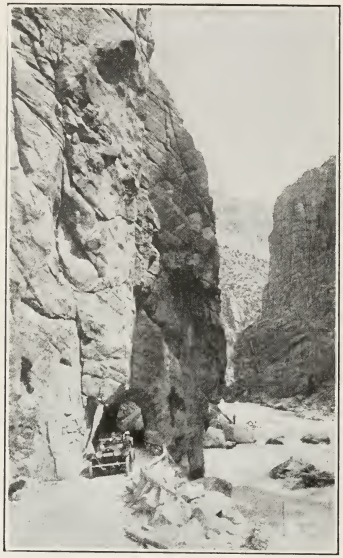
Cody, Wyo., founded by the late Col. Wm. F. Cody, "Buffalo Bill," is near the terminus of the Chicago, Burlington and Quincy Railroad branch. From Cody the automobile highway leads up the Shoshone River 55.2 miles to the eastern boundary of Yellowstone Park. To the main loop road in the Park at Lake Junction it is 82.2 miles.

Burlington Cody Inn, at the railroad depot, is nearly a mile from Cody proper, on the opposite side of the Shoshone River. (To use the Motorists' Log of this interesting drive set mileage indicator at 0.5 at the Shoshone River Bridge. The complete Log appears in the front part of this book.)

At 6.9 miles the first tunnel of six on this road is met in winding through the precipitous Shoshone canyon.

Shoshone Dam, at 7.6 miles, 328 feet in height, is the second highest in the world. Its top is 200 feet long

SHOSHONE CANYON, SHOSHONE RIVER 17253



SHOSHONE CANYON TUNNEL 17236

and ten feet thick, while its base is only 80 feet long and 108 feet thick. The immense reservoir created by the dam makes possible the irrigation of vast tracts of land along the course of Shoshone River.

At 29.2, seven-tenths of a mile past the **Overhanging Rock Cliff,** the irregular rock formations of the **Holy City** are seen at the right.

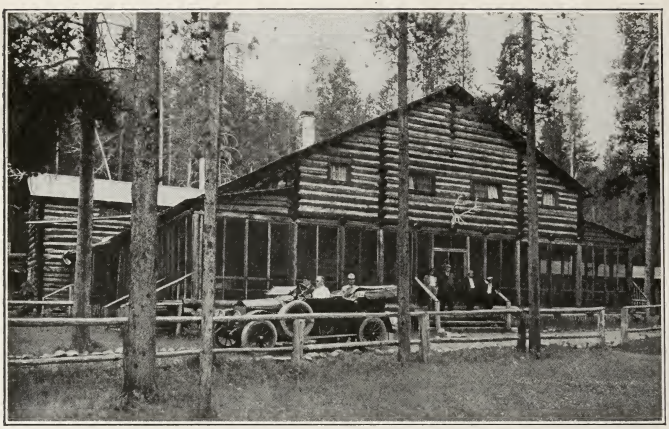
Thor's Anvil at 29.8 and the Thousand Foot Cliff at 30.6 are next passed.

At 42.6 the Elephant Head and the

ELEPHANT HEAD, SHOSHONE HIGHWAY 17255

SPIRAL BRIDGE, "S" HILL, SYLVAN PASS 22749

SYLVAN LAKE 17296



PAHASKA TEPEE LODGE 16408

Mutilated Hand both formed in the eroded rock are seen toward the north.

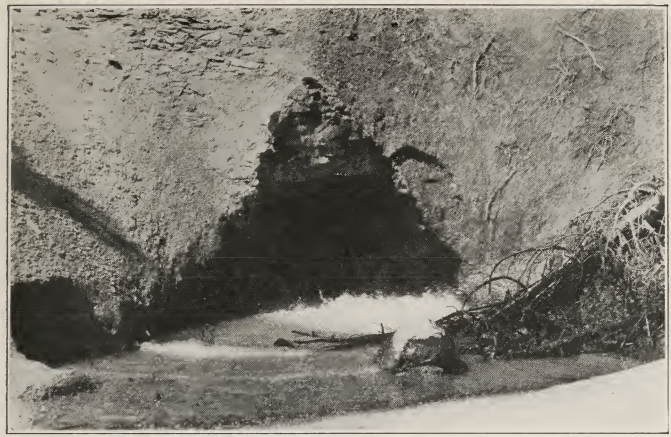
Chimney Rock at 43.2 by the roadside is the next prominent feature.

Pahaska Tepee, 52.9, Buffalo Bill's lodge, breathes the romance of that picturesque figure in Western history. It is near the junction of the North Fork of the Shoshone River and Middle Creek, 53 miles from Cody and about two miles east of the Park boundary.

The Sylvan Pass Ranger Station is at the **Eastern Boundary,** 55.2 miles from Cody and 27 miles from the main loop road in the Park on Middle Creek. The road climbs steadily to an elevation of 8,650 feet at

Sylvan Pass, at 62.9 miles. Lake Eleanor at 63.6, Sylvan Lake at 65.2 and Turbid Lake at 75.6 are next passed; before reaching the main loop road are the Osprey's Nest at 76.3 the **Fishing Bridge Public Automobile Camp** at 81.8, and the Fishing Bridge over the Yellowstone River at 82.0 miles.

From the **Lake Junction (LJ),** at 82.2, the right



DRAGONS MOUTH SPRING 22637

(north) road leads to the Grand Canyon, and the left road to Yellowstone Lake.

From the lake to the Grand Canyon the road follows the Yellowstone River through Hayden Valley.

Mud Volcano is 6 miles from the Junction on the mountain side; its funnel-shaped crater 30 feet deep, partly filled with a lead-colored mass of mud in violent agitation, produces an effect at once repulsive and fascinating. In 1898 violent eruptions occurred, which plastered surrounding trees with mud.

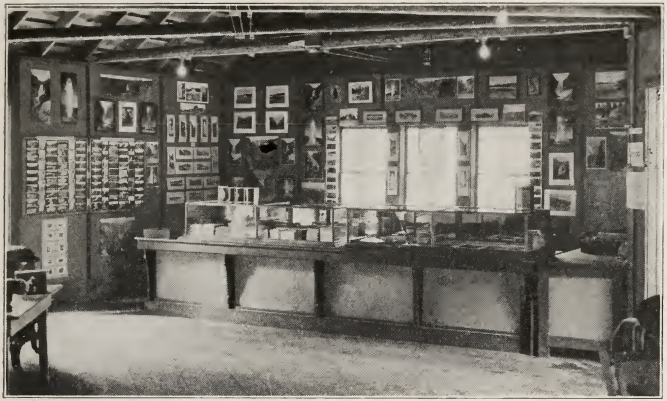
The Dragons Mouth Spring, a few rods north of Mud Volcano, is a beautiful, overflowing hot pool beneath a natural green colored rock gable. Its peacefulness pleasantly contrasts with the violence of the Mud Volcano.

The **Chittenden Bridge** across Yellowstone River is the longest Melan arch in the world. The road leads across this bridge to the Grand Canyon Camp and Artist Point, from which one may enjoy by far the best view of the Fall and Canyon.

GRAND CANYON CAMP BUILDING 16040

Grand Canyon Camp, one of the largest tent cities in the park, is within walking distance of the Upper Fall, the trail to the foot of the Great Fall and to Artist Point. Horseback rides, fishing trips, and photographing jaunts are among the popular pastimes here. At the camp each

CHITTENDEN BRIDGE, YELLOWSTONE RIVER 17054



HAYNES PICTURE SHOP, CANYON CAMP 22610

night is a large outdoor camp fire whose crackling embers syncopate the music of the dance within.

The **Upper Fall** has a perpendicular drop of 109 feet, and the water, striking a shelving rock at the bot-

HAYNES PICTURE SHOP, GRAND CANYON 22611

PUBLIC AUTOMOBILE CAMP AT GRAND CANYON 22679

tom of the abyss, shoots out rocket-like. Above the fall a jutting point affords an excellent view of the rapids, and the foaming waters rushing over the precipice. A footpath leads to the bottom of the Upper Fall, where very fine native trout fishing may be had.

The **Canyon Ranger Station** and **Community Center** is conveniently situated at the right of the road, and the **Public Automobile Camp** is at the left on the hill, across the road a little beyond the Ranger Station.

The **Haynes Picture Shop** built in 1922 situated in the Public Automobile Camp carries the complete Haynes line of pictures, Yellowstone books, films and photographic supplies.

Whittaker's Canyon Store, where supplies and gasoline may be obtained, is next door to the Ranger Station.

The **Grand Canyon Hotel** was first opened to the public June 15th, 1911, at a cost of over three-quarters of a million dollars. It accommodates six hundred guests.

UPPER FALL OF THE YELLOWSTONE, 109 FEET 14053

Spending the day at this hotel is a pleasure. A cozy foyer, extensive lounge and capacious dining room are all elegantly furnished and of novel architecture. Adjoining the main building is the lounge, where concerts and dances are held. It is remarkable that so many miles from any railroad, hotels can be so well equipped as to rival the best city hostelries.

Brink of the Lower Fall reached by a 494 foot stairway on the hotel side (northern) of the canyon affords a splendid view of Point Lookout and Red Rock at the left, and Artist Point nearly two miles away on the right side of the gorge.

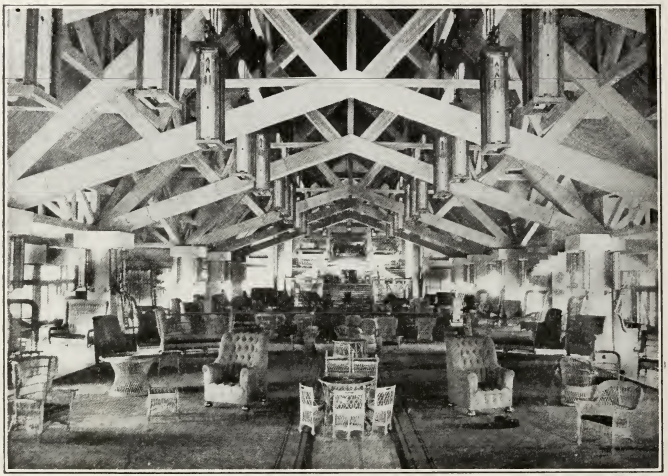
Grand View.—There are many projections between Lookout and Inspiration Points from which glimpses of the canyon may be had. Grand View is about midway nearly opposite **Artist Point.**

Inspiration Point is considered the best place from which to see and appreciate the immensity of the canyon.

GRAND CANYON HOTEL 14056

Glacial Bowlder, passed on the drive to Inspiration Point, bespeaks the great transporting power of the glaciers.

Rev. Dr. Wayland Hoyt describes as follows his conception of what Thomas Moran has said to be the most brilliantly colored landscape in existence:



GRAND CANYON HOTEL LOUNGE 13073

GREAT FALL OF THE YELLOWSTONE, 308 FEET 16260

"Look yonder! That is the Lower Fall of the Yellowstone. It is not the grandest in the world, but there is none more beautiful. There is not the breadth and dash of Niagara, nor is there the enormous depth of leap of some of the waterfalls of the Yosemite. But here is majesty of its own kind, and beauty, too. On either side are vast pinnacles of sculptured rock. There, where the rock opens for the river, its waters are compressed from a width of 200 feet between the Upper and Lower Fall, to less than 100 feet when it takes the plunge. The shelf of rock over which it leaps is absolutely level. The water seems to wait a moment on its verge; then it passes, with a single bound, 308 feet into the gorge below. It is a sheer, unbroken compact, shining mass of silver foam. But your eyes are all the while distracted from the fall itself, great and beautiful as it is, to its marvelous setting; to the surprising, overmastering canyon into which the river leaps, and through which it flows, dwindling to but a foamy ribbon there in its appalling depths. As you cling there to this jutting rock, the fall is already many hundred feet below you. The fall unrolls its whiteness down amid the canyon glooms. * * * These rocky sides are almost perpendicular; indeed, in many places the boiling springs have gouged them

GRAND CANYON FROM BRINK OF GREAT FALL 15049

out so as to leave overhanging cliffs and tables at the top. Take a stone and throw it over; you have to wait long before you hear it strike. Nothing more awful have I ever seen than the yawning of that chasm. And the stillness, solemn as midnight, profound as death. The water dashing there, as in a kind of agony, against these you cannot hear. The mighty distance lays the finger of silence on its white lips. You are oppressed with a sense of danger. It is as though the vastness would soon force you from the rock to which you cling. The silence, the sheer depth, the gloom burden you. It is a relief to feel the firm earth beneath your feet again, as you carefully crawl back from your perching place.

"But this is not all, nor is the half yet told. As soon as you can stand it, go out on that jutting rock again and mark the sculpturing of God upon those vast and solemn walls. By dash of wind and wave, by forces of the frost, by file of snow plunge and glacier and mountain torrents, by the hot breath of boiling springs, those walls have been cut into the most various and surprising shapes. I have seen the 'middle age' castles along the Rhine; there those castles are repro-

FROM THE SUMMIT OF MT. WASHBURN, 10,100 FEET 16276

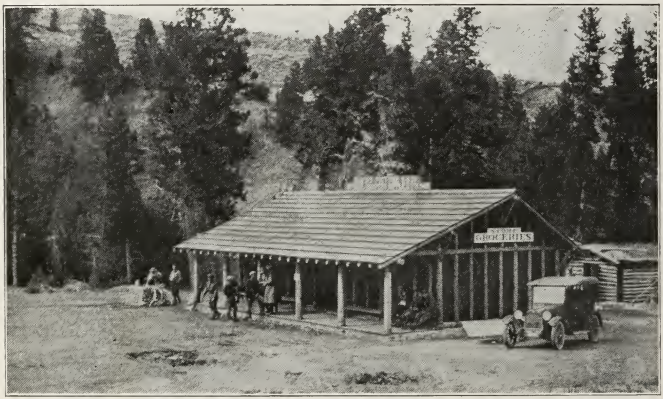
duced exactly. I have seen the soaring summit of the great cathedral spires in the country beyond the sea; there they stand in prototype, only loftier and more sublime.

"And then, of course, and almost beyond all else, you are fascinated by the magnificence and utter opulence of color. Those are not simple gray and hoary depths, and reaches and domes and pinnacles of sullen rock. The whole gorge flames. It is as though rainbows had fallen out of the sky and hung themselves there like glorious banners. The underlying color is the clearest yellow; this flushes onward into orange. Down at the base the deepest mosses unroll their draperies of the most vivid green; browns, sweet and soft, do their blending; white rocks stand spectral; turrets of rock shoot up as crimson as though they were drenched through with blood. It is a wilderness of color. It is impossible that even the pencil of an artist can tell it.

"Through nearly all the hours of that afternoon until the sunset shadows came, and afterwards amid the moonbeams, I waited there, clinging to that rock, jutting out into that overpowering, gorgeous chasm. I was appalled and fascinated, afraid, and yet compelled to cling there. It was an epoch in my life."

Mount Washburn, altitude 10,100 feet, the famous park promontory, is the highest mountain in the park which may be climbed by auto. From the Grand Canyon Hotel to the summit of this mountain, many thrills are experienced in driving for the first time up this steep incline of ten miles. The usual route, however, is not over the summit of the mountain, but through Dunraven Pass, altitude 8,900 feet, midway between Dunraven Peak and Mount Washburn.

Tower Fall Public Automobile Camp. In 1922 the National Park Service installed a large reservoir from which water comes from Tower Creek a long way above the camping ground; and provided sanitation facilities making this camping ground one of the best in the park. From this place it is only a short walk to the beautiful Tower Fall. The Haynes Picture Shop and General Store situated here affords tourists opportunities to restock their larders, replenish their fishing equipment and have the confidence that some permanent habitation is near at hand.



HAYNES PICTURE SHOP AND GENERAL STORE, TOWER FALL 22625

TOWER FALL, TOWER CREEK, 132 FEET 17884

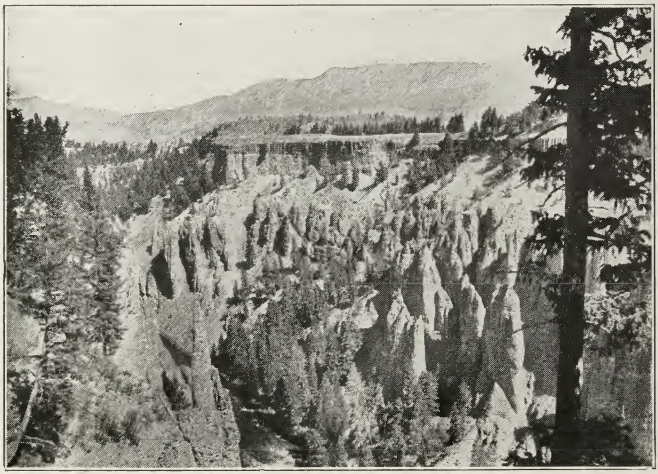
Haynes Tower Fall Picture Shop and General Store is the first stopping place. Cars may be parked here while the walk down a trail to Tower Fall is made. This site is desirable as a camping place for those who have their camping equipment with them. Fishing at the mouth of Tower Creek attracts those anglers whose pleasure is catching the larger and gamier specimens.

Tower Fall is 132 feet high; near it are the tall rock spires which gave this fall its name.

Camp Roosevelt, operated by the Yellowstone Park Camps Company, is three miles further on near **Tower Fall Junction (TJ)** and the **Tower Fall Ranger Station.**

(For continuation to Mammoth see page 115.)

The Buffalo Ranch, Cooke City and the Grasshopper Glacier region are reached by the side road which leads northeast from Tower Fall Junction.



GRAND CANYON NEAR TOWER FALL 14056

The **Buffalo Ranch,** maintained by the National Park Service, where the large "tame" herd of American Bison are, is 10.8 miles from Tower Fall Junction on the right side road. The buffalo in summer time are usually on their range in the hills and are not accessible except by a trail trip on horseback.

Cooke City, Montana, a quaint mining town in the heart of a group of towering mountains is 23.1 miles beyond the Buffalo Ranch, and 33.9 miles from Tower Junction on the main loop road.

Grasshopper Glacier is 12.2 miles from Cooke City, and is reached by trail only.

Emerson Hough, the well known sportsman, mountain climber and outdoor man, has the following to say regarding a trip now possible in the region just northeast of the park:

FACE OF GRASSHOPPER GLACIER 21027

"**The Grasshopper Glacier!** This extraordinary natural phenomenon just across the park line, fits well in the scheme of the great wonderland where all nature's manifestations seem cast in a freakish mold. So far as known, there is no counterpart of the Grasshopper Glacier in any other part of America, or of the world. Yet it is only recently that it has come into any general knowledge, and yet more recently that it has been made in any way accessible to the traveling public. It has grown very rapidly in interest and is to be regarded as one of the greatest natural curiosities in a region crowded with curiosities.

Situated at the head of the fork of the Rosebud River, in one of the boldest and most forbidding mountain regions on the continent, a great glacier, of unknown age, extends in a sheer white expanse for a space roughly in extent between a mile and three quarters of a mile. The upper covering is compacted snow, the under layer blue ice. The foot of the glacier breaks off in a vast, sheer ice wall, from beneath which breaks the mountain river. On all sides are formidable, bare mountain peaks, extending far above timber line, the elevation of the midsection of the glacier being around 10,500 feet.

Even as an example of glacial formation this landscape would be most impressive. An added interest is given by the curious natural phenomenon which gives the great ice field its name. The surface of the glacier to a great depth is filled with myriads of dead grasshoppers! Little black threads of melted snow water trickle over it. Why so black? Take up a handful of the substance which seems mud. It is neither more nor less than the remains of countless grasshoppers, at last uncovered to the air! You can see traces of feet, legs, parts of the body, heads; at times by digging you can obtain complete unoxidized specimens, perfect enough perhaps to serve as an angler's bait.

No one knows who first discovered the Grasshopper Glacier, the old time miners of Cooke City, at the northeast corner of the Park, began to talk of it years ago. No one knows whence came the vast clouds of grasshoppers, or at what time came the great cataclysm which caused them to fall here and perish, to be preserved imperishably in their icy death. Nature has her ways. Perhaps the green and yellow hordes started east. Caught in a chill rising from the glacier, it alighted or fell here. No man knows or can tell when that was.

As a trip to this strange new country makes a good complement to the round of the Park, Haynes' Guide now for the first time prints instructions for the trip.

Cooke City is the entry point, a quaint mining camp old almost as the Park itself, and one of the few genuine old time western towns, now remaining in existence—itself well worth the trip. Cooke City is reached by road from Tower Junction near Camp Roosevelt. The journey up the Lamar River and Soda Butte Creek to the northeast corner of the park is very beautiful. Private cars make the trip over roads averaging in import with any in the Park.

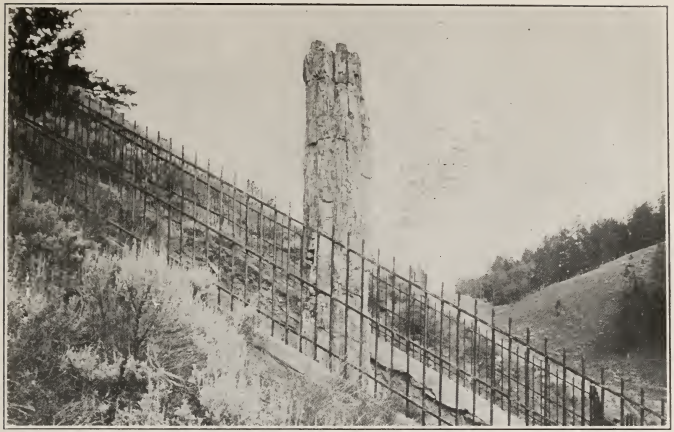
At Cooke City are local hotels, but the organized Glacier Service is from the camp of Walter C. Shaw, who maintains a good string of saddle horses, operated by competent and experienced guides.

The round trip can be made in one day by hardy travelers, and occupies ten or twelve hours, the ride over good mountain trails requires between three and four hours, the distance one way being around twelve miles. It is better to use more time and to spend the night at **Shaw's Goose Lake Tent Camp**. This camp brings one within a mile of the saddle summit beyond which the great glacier lies. The climb to this saddle covers about 1000 feet of elevation, and for a part over rough rocks, but for the greater distance over a very fair path.

The course across the face of the Glacier begins just beyond the saddle. It looks ticklish, but has been done in safety by scores of women and even children, although care should be used and a good guide always should be in charge. The party holds hands, and advances abreast in a long line. Ice cramps and steel shod staffs should be used, though many have crossed in walking shoes. So long as the sun keeps the snow surface thawed and soft it is safe. Toward evening, when the surface stiffens and grows slippery the danger increases. A good part of the glacier can be viewed without crossing. The time spent in the ascent and descent is usually around two hours. At least an hour should be spent in crossing the glacier and viewing the foot walls. More time is better.

The descent from Goose Lake is down Goose Creek, one of the head streams of the Stillwater, along a trail in part precipitous, but safely made by the mountain horses. This route, which swings far out from the trail used in the ascent from Cooke City is more rugged and impressive. It opens up one of the boldest and most awe-inspiring mountain landscapes in all the Rockies, the great peaks and walls of the Bear Tooth and the rugged Absaroka Ranges. This is the Lake Abundance trail. It lies past many abandoned mining cabins; and many openings in the rugged mountain sides show where many years ago men spent their lives in search of a fortune, which not all of them found. The last pass is 9,500 feet in elevation. Thence down to Cooke City the drop is some 2,000 feet in four miles. If the round trip is made in one day it is apt to be concluded in the dark, through the heavy forest. No more eventful and impressive single day can be spent in or around Yellowstone Park.

The Grasshopper Glacier trip is now one which must be counted in by anyone claiming thoroughly to have done Yellowstone National Park. It was only opened up late in the year 1921."



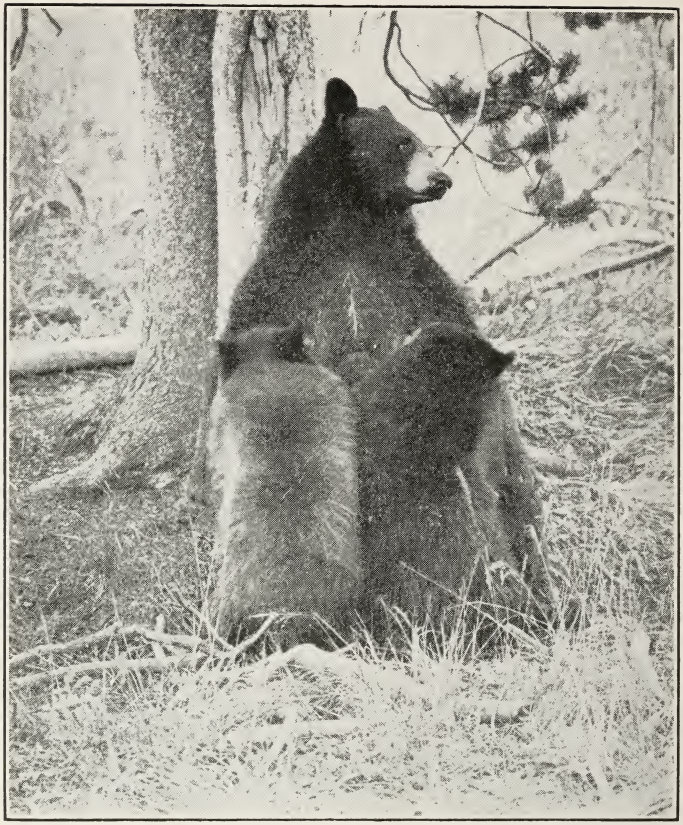
PETRIFIED TREE 10130

The **Petrified Tree** is situated one-half mile south of the main roadway, 16.7 miles from Mammoth Hot Springs; a large standing stump on the hillside.

It is 16.7 miles to Mammoth Hot Springs from the Petrified Tree, an interesting drive through the Canyon of the East Gardiner River, then over the high steel bridge which spans the Middle Gardiner River, two miles east of Mammoth.

Along the route from here to **Mammoth Hot Springs** Junction (MS) are seen the Beaver Dam, a splendid example of the engineering skill of beavers, Undine Falls, Mt. Everts (at right), Bunsen Peak (at left), and Terrace Mountain (ahead) shortly before reaching the junction of the roads, where the road from Gardiner, Mont., **North Entrance** (Northern Pacific Terminal) enters from the right. Gardiner is 4.5 miles from the junction; and Mammoth Hot Springs are just beyond the **Mammoth Public Auto Camp Grounds.**

(For continuation of trip around the park see Road Log, page 19, and descriptions, page 35.)



THE WOMAN BEAR 16343

This picture, which has appeared in the Ladies Home Journal, and in the National Geographic Magazine was named by Ernest Thompson Seton who termed it "The Most Remarkable Wild Animal Picture Ever Taken." It was made in the forest near the Grand Canyon of the Yellowstone. (Copyright J. E. Haynes.)

ANIMALS OF YELLOWSTONE PARK

Edited by Dr. Edmund Heller, Famous Hunter, Naturalist and African Explorer.

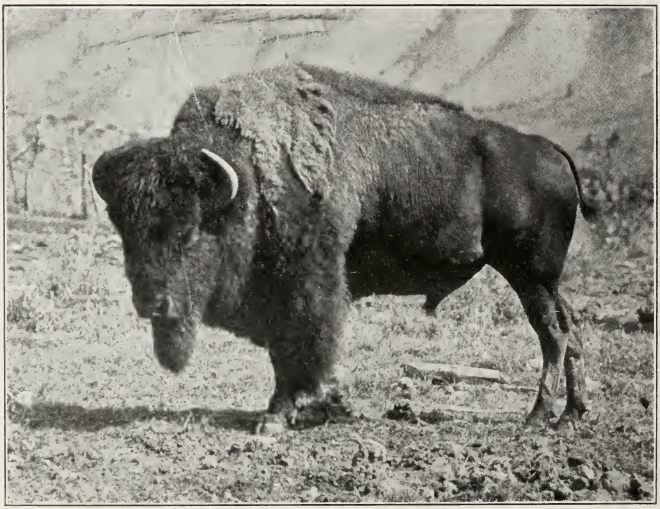
ALTHOUGH unfenced, Yellowstone Park is the largest and best game preserve in North America. Being suited to the habits of such a large number of species of large and small animals, it preserves them in their natural state free from molestation by the hunter. With exception of the Mountain Lion and Coyote, both of which are very harmful to the young of the other large game, especially the young Mountain Sheep, Elk, Deer and Antelopes, all animals that naturally inhabit this remarkable region are protected in every possible way. All hunters and poachers are rigidly excluded, and in winter, when it is difficult to procure forage, the Elk and Antelope are supplied with hay.

Noblest among our wild animals is the **Grizzly Bear.** Misunderstood for many years, his aggressiveness greatly overrated, we now know him as a marvelously sagacious wild thing, crafty in hiding, loving concealment. Reports of his attacking man unpro-

A BLACK BEAR 13053

voked are usually very difficult of proof. His great strength and agility make him the most formidable of antagonists when aroused. He is not a tree-climbing bear, but uses his long claws for digging out small animals and roots. He is omnivorous, but the Grizzly of the Yellowstone region has a marked tendency to relish meat in preference to other food, because of the abundance of game in this district. As an actual killer of large game and of cattle he rarely plays an active part. The Grizzly will not often be met by the tourist except about a few of the feeding grounds at twilight. There he is not afraid of the scent of man.

The Grizzly should be distinguished from the Black Bear by his shape. The shoulders are high, surmounted by a mane or "hump" of long hair. The limbs are long, the frame somewhat lanky. The range in color of hair is great; a coat of brownish or blackish dingy uniform-colored hair is covered in front and over the



BUFFALO BULL (AMERICAN BISON) 21202

BUFFALO STAMPEDE, LAMAR RIVER VALLEY 16181

back and head by a mantle of black and white or whitish glossy hair.

The **American Black Bear** exists in Yellowstone Park in a number of color phases. The commonest type is black with a brown nose and the animal usually sports a white chest patch. Then there are dark brown and medium brown, reddish brown and dull buffy brown individuals. These dull buffy animals are known as "cinnamon" bears. The Black Bear has low shoulders and in the latter end of summer he shows a great tendency to roly-poly fatness. He will eat anything, and is a daylight patron of the feeding grounds, where he remains for a short time eating rather daintily and then silently departs. His claws are short and he climbs trees like a cat and then lolls about in the branches like a lazy boy. The trees seem to be his only summer home. His manners are fascinating, but he often shows himself a very scrappy quarrelsome animal.

Some of the Black Bears fear man so little that they feed from his hand. There is a Park rule against this proceeding that has its foundation in solid com-

PRONG-HORNED ANTELOPES NEAR NORTH ENTRANCE 10148

mon sense. These bears are powerful and timid wild animals, and exceedingly nervous, and any unusual movement alarms them and they may strike or bite. They resent any form of teasing, such as withholding food. It is unfair to the bears to feed them by hand, for bears that bite many tourists must be shot and no one is to blame but the tourists. Do not allow children to go near the bears.

The **Buffalo** or **American Bison,** which but a few years ago grazed in countless thousands on the Western plains, are now counted in tens; only a score or more remain in their natural state—straggling remnants of perhaps the stateliest species of hoofed animals in America; these are roaming over secluded areas in the park unmolested and are seldom seen.

Near Mammoth Hot Springs the National Park Service keeps a herd of buffaloes during the tourist season—the "show" herd—in a fenced area not far from Mammoth Camp. The "tame" herd, of several hundred, is kept at the Buffalo Ranch, and the "wild"

ELK IN HAYDEN VALLEY 16621

herd usually ranges near the headwaters of Pelican Creek.

The **Prong-horned Antelope,** found only in North America, lives in isolated bands in but few localities in Western America, chiefly in the Yellowstone Park. This keen-eyed animal, fleet of foot and timid, will doubtless soon become extinct in all places but the park; as it does not endure in captivity it must be preserved in its wild state. Unlike the Elk, Deer and Caribou, the Prong-Horned Antelope is armed with hollow horns like those of cattle, but unlike cattle the animal sheds its horns each year, a long pointed bony horn core covered by the undeveloped new horn always remaining.

Big Horn Sheep, or **Mountain Sheep,** are found where the scenery is grandest in high mountain places where none but bold and reckless climbers would dare to go. Its young are reared in the highest and most inaccessible places, and as a result, the larger birds are their only dangerous enemy. Bands of Mountain Sheep frequent the high bluffs overlooking Gardiner Canyon at the northern part of the park. They are also found

A PARK DEER 10138

in a few widely separated localities in the Rocky Mountains from British Columbia to Mexico. No other wild animal has spiral close-whorled horns; those of the Mountain Sheep make nearly a complete circle and are in cross section circular and very heavy.

There are thousands of **American Elk,** or **Wapiti,** in Yellowstone Park, several photographs having been taken showing groups of several hundred. The Elk is as tall as a horse, handsomely formed, has a luxurious mane and imposing antlers. Even the young of this species are stately; they "step about with the air of a game cock." It seems remarkable that antlers of such great size can be grown to maturity in a few months, to be lost and regrown each year. It is not uncommon for tourists to see Elk and Deer from the roadside while driving over the main highway of the park.

The **Deer** attract fully as much if not more attention than the Elk on the part of the traveler; two mem-

bers of the Deer family proper occur in the park, the Mule Deer, and the White-Tailed Deer. The former has larger antlers, which fork dichotomously, in shape like two Y's on each horn. The coat of the Black-Tailed Deer is steel gray in winter and gray brown in summer. Except in the park it is being destroyed much faster than it breeds, which means an early extinction of this species. The White-Tailed Deer, unlike the Mule Deer, is a skulker; it hides in the brush and carries its head low, so seldom is seen. Its name is derived from its long bushy tail, which is white underneath and pointed.

The **Moose** is one of the few big game animals that is increasing steadily. Moose are now abundant about Yellowstone Lake and the Upper Yellowstone River near the south boundary. They are spreading northward and occur in the Lamar watershed and the Gallatin range. They are the largest living deer-like animals and inhabit swampy forest regions.

The most famous but least known member of the cat family in North America is the **Puma**, or **Mountain Lion**; it makes its den among the rocks or in the dense forests and preys upon every creature that can be killed and eaten, doing much harm to the young Elk, Deer, Mountain Sheep and Antelopes. The Mountain Lion is a good climber; it is tall for its weight, flat-sided and on an average about seven feet long from tip to tip. In color it is a brownish drab. On account of the diligent work on the part of the park authorities, this harmful animal is becoming practically extinct in the reserve.

Bobcats and **Lynxes** also occur in the Park in small numbers.

The **Timber Wolf** is present in the Park in very limited numbers. It is seldom seen, and does not increase because of the vigilance of the rangers.

Coyotes, like the Mountain Lion, prey upon the young of many valuable species; they, too, are "shot on sight" by the rangers in the park. They are numer-

ous in the lower altitudes of the park; not infrequently their dog-like yelping is heard in the vicinity of the hotels. Washouts and holes in the sides of ravines furnish dens for the coyote. They multiply with comparative rapidity, having from five to seven puppies each year.

Of the small fur-bearing animals in the park, there are the Otter, Mink, Weasel, Marten, Skunk, Badger, and Wolverine.

The **Otter,** being fond of water and living chiefly on fish, makes its home usually under the roots of a large tree overhanging the banks of a stream. It has webbed feet and a thick, flat tail for use in swimming. The fur of the Otter is very fine and of a dark brown color.

The **Mink** haunts the margins of streams and rivers and is less aquatic than the Otter. It preys on small animals and fish when it can procure them. but lives chiefly on birds; it is smaller than the Otter, and its fur, which is yellowish or dark brown, is highly prized.

The **Common Weasel,** or **Ermine,** is a small, long-bodied animal with short legs, the smallest member of the Marten family. It kills grouse, ducks, rabbits and other animals, some ten times its own size, and is considered the most vicious of all animals. In summer its coat is brown, but white in winter, a striking manifestation of Nature's plan of protection.

The **Marten** lives on small rodents, birds and eggs, and spends so much time in the trees that it is often called the **Pine Marten.** Its habitat is on rugged and rocky forest-covered mountains, seldom in open country.

The **Wolverine** is a heavily built carnivorous animal like a diminutive bear in appearance, but with a short distinct tail. It is one of the rarest animals in the Park, but quite a number are trapped annually beyond the Park boundaries.

The **Common Skunk** is of conspicuous jet black color, with two wide stripes of white running lengthwise over its back; its fur is becoming valuable on account of the scarcity of Otter, Beaver, Mink and Marten; before being used, however, the white portions are dyed black.

The **Badger** has a broad, flat back, and like the Weasel, has very short legs and is very savage. It may, when at a distance, be distinguished from the woodchuck by its black and white striped face. It lives in burrows and feeds on squirrels and other ground game of every description.

Along the Park highways the **Pine Squirrel** is often seen, while the **Chipmunk** is likewise abundant. The **Kennicot Spermophile** or **Picket-Pin Ground Squirrel** lives in the open country in places like Swan Lake Valley, and is seldom seen in rocky places or in the trees. This species hibernates even longer than the woodchuck, while the other squirrels hibernate little or not at all.

The **Woodchuck** or **Ground Hog** is a rodent with a squirrel-like face and long incisors for gnawing. It is much larger than any squirrel and is of a rich brown color. It is often seen by the roadside sunning himself near his burrow. In autumn he does not store up a winter's supply of provisions like the squirrel, but takes on a quantity of fat under the skin, then goes quietly to sleep in his burrow for four or five months when the winter is severest, hibernating like the bear.

The **Beaver** is celebrated for his engineering skill in building dams, some of great extent, for the purpose of providing in streams a safe refuge from his enemies. He constructs a water entrance to his house and a place below the freezing line for his winter supply of food. The Beaver is easily recognized by his broad, hairless tail, which he uses as a rudder in swimming. It is not uncommon for Beavers to fell trees which are as much as a foot in diameter, by gnawing, and it is said that they cut them so they will fall toward their pond. The favorite bark prized by them in the park is the aspen. Beaver dams are seen from the roadway in Willow Park, in Beaver Lake at the foot of Obsidian Cliff, and in several other places in the reserve. The Beavers themselves are seldom seen during the daytime, or in fact at any other time; they work in the evening.

The **Muskrat,** largest member of the family of mice and rats in the park, is found along the banks of streams where burrows can conveniently be made. They are quite as much at home in the water as Beavers, and like the Beavers they have powerful tails which serve as rudders in swimming. They are propelled through the water by their hind feet which are webbed. Muskrat fur when dyed a rich brown black, plucked and dressed, is known as "French seal."

Porcupines are so abundant in the park, and destroy so many trees, that it may become necessary to have a lot of them killed. They live chiefly upon bark and are equally at home in the tree-top or on the ground. It is known that the Porcupine has caused the death of more than one Mountain Lion and Lynx by means of its quills; any animal attempting to bite the Porcupine gets its mouth filled with spines, which prevent its eating, causing death by starvation. It has been stated that the quills are thrown by the Porcupines; this, however, is not the fact. When attacked he huddles into a ball completely covered with quills and strikes his adversary with his tail, at the same time lodging in him many painful spines.

Two Rabbits, or more properly hares, are found in the Park. The **Varying Hare** or **Snowshoe Rabbit** is the common species and is found only at altitudes below 7,000 feet. In autumn its brown summer coat changes to white and gives it continued protective coloration in the snowy landscapes of winter. A rarer species is the **White-Tailed Jack-Rabbit,** which also assumes a white winter coat, and is unique among our Jack-Rabbits in this character. It may be distinguished from the Varying Hare by its white tail and by its longer ears. It inhabits the lower altitudes near the north entrance in the vicinity of Mammoth Hot Springs.

Reptiles are rare in the park region, and it is a comforting fact that the Rattlesnake is not found above 6,000 feet altitude. The average altitude in the park is 8,000 feet.

BIRDS OF THE YELLOWSTONE

While the variety of birds in Yellowstone Park is large, only a few of each kind are seen. The most important ones are the Eagle, Osprey, Sea Gull, Pelican, Goose, Swan, Crane, Crow, Raven, Magpie, Lark, Blackbird, Robin, Grouse, Rocky Mountain Jay, Pinyon Jay, Black-headed Jay and a large variety of ducks.

EAGLE NEST ROCK 10071

The Osprey, or Fish Hawk, usually builds its nest on inaccessible pinnacles and tree-tops near lakes and streams. The accompanying illustration shows an Osprey's nest in Gardiner Canyon, which since the early days has had the misleading name of Eagle Nest Rock.

Wild Ducks and Geese are frequently seen from the roadways; and on Yellowstone Lake are many water fowl.

"Large numbers of the Canada geese have reared their young in the park and showed little fear of molestation by visitors. Also ducks of many varieties. Pelicans and gulls occupy the entire surface of one small island in Yellowstone Lake as their nursery. More than seventy species of birds come to the park to rear their young."—GENERAL S. B. M. YOUNG.

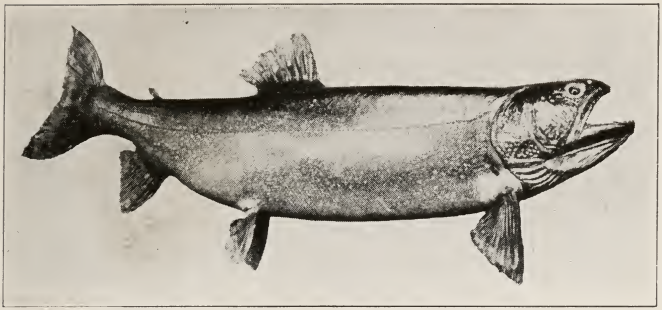
FISH AND FISHING

The United States Bureau of Fisheries has had an important part in making Yellowstone Park one of the foremost resorts for the angler in America. With the exception of Yellowstone Lake and River, practically none of the streams or lakes had native trout, or fish of any kind, in their waters before they were stocked. Since 1889 many millions of trout fry and fingerlings have been planted in the various streams and lakes; and in 1904 a fish hatchery was built on Yellowstone Lake.

In explanation of the previous lack of fish in this region, which seems so well suited to their habits, David Starr Jordan in 1889 wrote as follows:

"The streams of the park are for the most part among the coldest and clearest of the Rocky Mountains, and apparently in every way suitable for the growth of trout * * * yet, with exception of the Yellowstone itself, all these streams are destitute of fish life. The plateau is fringed with cataracts which no fish can ascend; each stream has a canyon and waterfall near the point where it exchanges the hard bed of lava for the softer rock below. So the best of trout streams

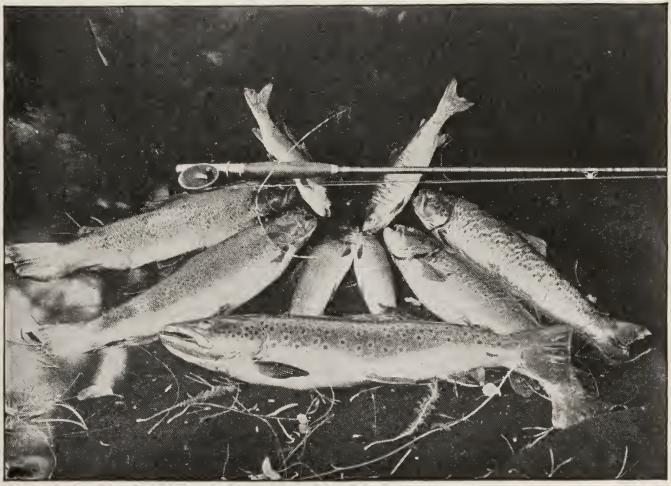
TROUT FISHING IN SNAKE RIVER 17021



AN EIGHTEEN-POUND TROUT 39½ INCHES LONG CAUGHT IN SHOSHONE LAKE

for an area of 1,500 square miles are left without trout, because their natural inhabitants cannot get to them."

Today practically all of the streams in the reserve are well stocked, and afford excellent sport for the angler. Among the varieties of trout are: Rainbow, Brook, Loch



TROUT FROM THE MADISON RIVER 13089

Leven, brown, and the native trout; while in the Madison River, near the Western Entrance, are the Grayling, and in the Gardiner River the White fish.

Ranger Earl Bowman, of the Snake River Station, in 1920 caught a trout 38 inches long, weighing 22 pounds, which to date is the largest trout ever caught in the Yellowstone.

Regulations governing fishing prohibit the use of any other means than the hook and line; no one person is allowed to catch more than ten fish in one day, and all fish under 8 inches in length must be returned to the water.

TREES OF YELLOWSTONE PARK.

This article and the following one on Flowers are by Frank E. A. Thone, Ph.D., author of

"Trees And Flowers Of Yellowstone National Park."

About four-fifths of the area of Yellowstone Park is under timber. The park thus forms a great permanent forest reserve. The timber will never be of any importance commercially, for government policy will never permit cutting; but it is of great importance as a headwater, or floodwater, control over two of our great river systems. On the Pacific side of the continental divide rise the headwaters of the Snake river, the largest tributary of the Columbia, and on the Atlantic side, comprising most of the Park, are the watersheds of the principal sources of the Missouri.

A forest acts as a check on floods partly because its shade prevents rapid melting of the snows in the spring, and partly because the dead leaves and rotting wood make a spongy soil that absorbs rain and snow water, permitting it to trickle out very slowly

instead of rushing down the slopes as fast as it falls. It is of great importance to the people of the United States in general to preserve intact not only the forests in the National Parks, but also the timber on the headwaters of all the important river systems.

The tree population of the Park consists almost entirely of conifers. About three-fourths of all the trees are **lodgepole pine,** known also as **black pine** (Pinus murrayana). This tree dominates the park plateau, forming thick stands of tall, slender trees, that bear branches only near the tops. The wood is of small value as lumber, but finds some use as poles and logs for cabins. The ranger stations throughout the park, as well as the Old Faithful Inn, are built of lodgepole pine logs.

There are two other kinds of pines in the Park. The **limber pine** grows below the general level of the park plateau, principally in the neighborhood of Mammoth Hot Springs, and the **whitebark pine** at the higher altitudes. Both of these trees belong to the white pine series, having their needles in clusters of five, as distinguished from the lodgepole pine, which belongs to the yellow pine series, with its needles in clusters of two.

Second place in numbers of trees and area occupied is held by the **Douglas spruce,** which has a close competitor in the true spruce, or **Engleman spruce.** Both of these trees require rather more water than does the lodgepole pine, and are found principally in ravines and on moister slopes. Both form tall, spire-shaped trees, and both have short, rather stiff needles, borne singly all over the twigs. They can be told apart principally by the cones. The cone of the Douglas spruce has a small three-pointed bract or appendage projecting between each pair of scales, but in the cone of the true spruce this structure is absent.

Another fine, spire-shaped tree is the **fir,** or **balsam.** This is not so abundant as the spruces; where it occurs it is found in company with them. It may be distinguished by the two-ranked arrangement of its needles, by the unusual amount of resinous gum in its bark, and by the fact that its cones point upward instead of hanging downward.

There are two species of **juniper,** one a tree, usually misnamed **cedar,** and the other a sprawling bush. The leaves are either very small and scale-like, clothing the twigs so completely that the wood cannot be seen, or they are short and tapering with exceedingly sharp, needle-like points. The fruits of the junipers are not cones, but small blue berries covered with a waxy, whitish "bloom."

There are only two kinds of deciduous, or broad-leaved, trees in the Park. The **narrow-leaved cottonwood** or poplar is found only near the Gardiner entrance, and a few transplanted specimens at Mammoth Hot Springs. The **aspen,** or **quaking-asp,** which is also a member of the poplar family, is very abundant in many parts of the Park, acting as a pioneer tree in burnt-over areas or in the occupation of newly forested land. It is a small tree with a white trunk and small, roundish leaves.

Other species, which reach tree size at lower altitudes, are found here only as large bushes. These include **maple, alder, birch, wild cherry** and many kinds of bushy **willows.**

FLOWERS OF YELLOWSTONE PARK.

By Frank E. A. Thone, Ph. D.

In addition to the trees, Yellowstone Park contains also a great wealth of smaller plant life. It is indeed a great natural wild flower garden, displaying about six hundred and fifty species. No part of

the Park is without some share of the blessing of flowers. In the mountain meadows the plants stand so thick, and are so rich with bloom, that the blues and yellows and whites of the petals almost obscure the green of the leaves. And even the blinding white sands in the geyser basins are not absolute deserts, for a few plants persist; dwarf and depauperate, to be sure, but maintaining a determined hold and bearing their flowers and seed each year.

Many of the flowers, like the violets, wild sunflowers, goldenrods, asters, and so on, are reminiscent of other parts of this country, but there are many others more or less peculiar to the region, that are quite striking and frequently very beautiful. It is, of course, impossible even to enumerate them all in a limited space, but mention may be made of the more conspicuous.

In the early spring there are two flowers found in the dry areas at the lower altitudes that are very interesting. These are the **rock rose** and the **bitterroot.** Though unrelated botanically, they look somewhat alike, being large, open, rose-colored blossoms borne in a cluster of leaves close to the ground. The **pasque flower,** a beautiful light blue cup, is another early comer; also a deep-blue **clematis,** which closely resembles the cultivated clematis vine.

Among the flowers of spring and early summer might be mentioned the **water-leaf,** a bold blue spike that lines the roadsides; the **lungwort,** with clusters of pendulous light-blue bells; the **camass,** which bears a spike of blue flowers shaped like little lilies; several kinds of **phlox,** forming cushion-like mats of white flowers on rocky slides, even to the summits of the mountains; misty-white **bedstraws** and bright yellow **dog-tooth violets** in the woods, and everywhere in open places the little blue **forget-me-not** dear to all romancers and poets.

Summer brings also a number of flowers that persist until fall, some of them braving even the frost. Blue flowers again hold a prominent place. **Wild flax** and **harebell** adorn open places; they both have very slender stems and narrow leaves, but the flower of the flax is open and flat, with five separate petals, while that of the harebell, as the name implies, forms a true little bell, with five broad points at the edge. There are several kinds of **beard-tongue,** all of them blue. Three-foot spikes of **larkspur,** and its kin-plant **monkshood,** are very abundant, the former in fairly dry, gravelly locations, the latter most frequent in moist meadows. The shades of blue affected by these plants are very appropriate to their names: the blue of the larkspur is the color of the morning sky, while that of the monkshood is the more sober hue of night. Blue-and-white **lupines,** with their dense spikes of pea-shaped flowers standing stiff as grenadiers, line all the roadsides and climb the mountains almost to timber-line. The **fringed gentian,** stately and hardy, is a popular park flower.

But blue is not the only fashion. The **Indian paintbrush,** or **painted cup,** wears almost everything else; its bold splashes of color on the open hillside range all the way from a rich creamy white to a fiery red. Red also, staring, uncompromising, magenta red, is the taller of the two most common varieties of **monkey-flower,** or **false snapdragon;** the other of the pair, which is much addicted to warm baths in the run-off from the geysers, is lemon-yellow. The only **columbine** in the Park is not blue, like its Colorado cousin, but bright yellow also. There is a yellow **sulphur-flower** that grows in the drier places; but its close relative, the **wild buckwheat** or **umbrella-plant,** spreads a flat head of fine white flowers among the sagebrush. Another flat-headed, white-flowered plant is the **cow-parsnip,** whose stout, hollow stems and huge, hairy leaves domineer all roadsides.

Extremes of life-conditions have their peculiar floras: ponds have their floating masses of yellow **water-lilies,** and occasionally also that strange plant, the **bladderwort,** whose roots and finely-divided leaves as well are submersed and floating, with only the naked stem and its odd, yellow flower, standing above the surface of the water. At the other end of the scale there is the **prickly-pear cactus** in a few extremely dry soils, and very abundantly distributed **stonecrop** species, that find a roothold on the naked rock.

When the **goldenrods** and **asters** come into bloom they are accompanied, at the lower elevations, by thick, round bushes of bright-yellow **rabbit-brush** and by the sticky, daisy-like, yellow **gumweed.** Another plant of middle and late summer is the **groundsel,** a tall, bushy growth with many lance-shaped, tooth-edged leaves and abundant small, yellow flowers.

But perhaps the most abundant and most striking of the flowers of late summer and early autumn is the **fireweed,** whose great loose heads of crimson bloom flow along the roads like flame. The plant gets its name from the fact that it is always the first to take possession of a burnt-over area after a forest fire. It is a natural pioneer, producing great quantities of down-winged seeds that settle thickly wherever the wind carries them, and are always prepared to assert first claim to any open space.

Thus the pageant marches through the summer, from frost to frost, beginning slowly and with few performers in June, rapidly reaching its climax by the end of July, diminishing again until the cold comes early in September, a few lingerers remaining at last until they are buried by the snow. To the flower-lover an opportunity to watch it pass for a season, or even for a part of a season, is an uninterrupted fascination and a delight.

RULES AND REGULATIONS

Yellowstone National Park

PERTAINING TO MOTORISTS.

Pursuant to authority conferred by section 2475, United States Revised Statutes, the act of Congress approved May 7, 1894 (28 Stat., 73) as amended June 28, 1916 (39 Stat., 238), and the act of August 25, 1916 (39 Stat., 535), as amended June 2, 1920 (41 Stat., 732) general regulations approved January 24, 1922, with the amendments hereinafter set forth, are hereby approved, to continue in force and effect until otherwise directed by the Secretary of the Interior.

1. **Entrances.**—Automobiles and motorcycles may enter and leave the park between 6 a. m. and 9:30 p. m. by any of the entrances, viz.: northern or Gardiner entrance, western or West Yellowstone entrance, eastern or Cody entrance, Southern or Snake River entrance. The superintendent may in his discretion keep any or all of the gateways open longer each day should the public convenience make this appear necessary.

2. **Automobiles.**—The park is open to automobiles operated for pleasure but not to those carrying passengers who are paying, either directly or indirectly, for the use of machines (excepting, however, automobiles used by transportation lines operating under Government franchise), and any person operating an automobile in contravention of the provisions of this regulation will be deemed guilty of its violation.

Careful driving is demanded of all persons using the roads.

The Government is in no way responsible for any kind of accident.

3. **Motorcycles.**—Motorcycles are admitted to the park under the same conditions as automobiles and are subject to the same regulations, as far as they are applicable.

4. **Motor Trucks.**—Motor trucks may enter the park subject to the weight limitations and entrance fees prescribed by the Director of the National Park Service. Schedules showing prescribed weight limitations and entrance fees for motor trucks may be seen at the office of the superintendent and at the ranger stations at the park entrances.

5. **Permits.**—The permits shall be secured at the ranger station where the automobile enters, and will entitle the permittee to operate the particular automobile indicated in the permit over any or all of the roads in the park. It is good for the entire season expiring on December 31 of the year of issue, but is not transferable to any other vehicle than that to which originally issued. The permit shall be carefully kept so that it can be exhibited to park rangers on demand. Each permit shall be exhibited to the park ranger for verification on exit from the park. Duplicate permits will not be issued in lieu of original permits lost or mislaid.

6. **Fees.**—Fees for automobile and motorcycle permits are $7.50 and $2.50 respectively, and are payable in cash and by travelers cheque.

7. **Direction.**—Automobiles shall pass around the road system forming the "loop" in the direction opposite to that of the hands of a clock as indicated by the arrow printed in red on the automobile guide map. The reverse direction may be taken as follows:

Norris Junction (NJ) to Mammoth Hot Springs (MS) any time day or night.

Madison Junction (MJ) to Norris Junction (NJ) any time of day or night except the periods 9 AM to 11:30 AM and 2 PM to 4:30 PM.

Upper Geyser Basin, Old Faithful (OF) to Western Entrance (WE) any time, day or night.

Canyon Junction (CJ) to Lake Junction (LJ) any time day or night.

Mammoth Hot Springs (MS) to Tower Fall, early enough to reach Tower Fall by 1 PM. Distance 19.6 miles.

Canyon Junction (CJ) to Norris Junction (NJ) direct, any time day or night.

Summit of Mt. Washburn (Mt.W.) down north side to junction of Dunraven Pass road, thence to Canyon Junction (C.J.) after 5:00 P. M.

The Superintendent of the park has authority to change routing of cars if necessary.

8. **Distance Apart, Gears and Brakes.**—Automobiles while in motion shall not be less than 50 yards apart, except for purpose of passing, which is permissible only on comparative levels or on slight grades. All automobiles, except while

shifting gears, shall retain their gears constantly enmeshed. The driver of each automobile will be required to satisfy the ranger issuing the permit that all parts of his machine, particularly the brakes and tires, are in first-class working order and capable of making the trip, and that there is sufficient gasoline in the tank to reach the next place where it may be obtained. The automobile shall carry at least one extra tire.

9. **Speeds.**—Speed is limited to 12 miles per hour on grades and when rounding sharp curves. On straight open stretches when no vehicle is nearer than 200 yards the speed may be increased to 25 miles per hour. The speed of all motor trucks is limited not to exceed 15 miles per hour on all park roads.

10. **Horns.**—The horn shall be sounded on approaching curves or stretches of road concealed for any considerable distance by slopes, overhanging trees, or other obstacles, and before meeting or passing other machines, riding or driving animals, or pedestrians.

11. **Lights.**—All automobiles shall be equipped with head and tail lights, the headlights to be of sufficient brilliancy to insure safety in driving at night, and all lights must be kept lighted after sunset when automobile is on the roads. Headlights shall be dimmed when meeting other automobiles or horse-drawn vehicles.

12. **Muffler Cut-outs.**—Muffler cut-outs shall be closed while approaching or passing riding horses, horse-drawn vehicles, hotels, or camps.

13. **Teams.**—When teams, saddle horses, or pack trains approach, automobiles shall take the outer edge of the roadway regardless of the direction in which they may be going, taking care that sufficient room is left on the inside for the passage of vehicles and animals. Teams have the right of way, and automobiles shall be backed or otherwise handled as may be necessary, so as to enable teams to pass with safety. In no case shall automobiles pass animals on the road at a speed greater than 8 miles per hour.

14. **Overtaking Vehicles.**—Any vehicle traveling slowly upon any of the park roads shall, when overtaken by a faster moving motor vehicle, and upon suitable signal from such overtaking vehicle, give way to the right, in case of motor-driven vehicles; and to the inside, or bank side of the road, in case of horse-drawn vehicles, allowing the overtaking vehicle reasonably free passage, provided the overtaking ve-

hicle does not exceed the speed limits specified for the park highways.

15. Accidents, Stop-overs.—Automobiles stopping over at points inside the park, or delayed by breakdown or accidents of any other nature, shall be immediately parked off the road, or, where this is impossible, on the outer edge of the road.

16. Fines and Penalties.—Any person who violates any of the foregoing regulations shall be deemed guilty of a misdemeanor and shall be subject to a fine of not more than $500.00 or imprisonment not exceeding 6 months, or both, and shall be adjudged to pay all costs of the proceedings or may be punished by revocation of the automobile permit, and by immediate ejectment from the park, or by any combination of these penalties. Such violation shall be cause for refusal to issue a new automobile permit to the offender without prior sanction in writing from the Director of the National Park Service, or the superintendent of the park.

17. These regulations do not apply to motor traffic on the county road in the northwest corner of the park.

18. Garages, Repairs, Supplies, Free Automobile Camp Grounds—Gasoline, oils, tires, and accessories are available for purchase at regular supply stations at Mammoth Hot Springs, Upper Geyser Basin (Old Faithful), Yellowstone Lake, and Grand Canyon. Repair shops and garages are maintained at these points. Gasoline and oil may also be procured at Camp Roosevelt. Prices of supplies and rates for repair work are strictly regulated by the National Park Service. Free public camp grounds for motorists are maintained at points indicated on the automobile guide map, and by "Good Camp" signs.

19. Reduced Engine Power—Gasoline, Etc.—Due to the high altitude of the park roads, averaging nearly 7,000 feet, the power of all automobiles is much reduced, so that a leaner mixture and about 50 per cent more gasoline per mile is required than at lower altitudes. Likewise one lower gear will generally have to be used on grades than would be necessary elsewhere. A further effect that must be watched is the heating of the engine on long grades, which may become serious unless care is used.

Motorcycles equipped with single speed engines will encounter serious difficulties in negotiating the heavy mountain

grades, and drivers are warned against making the attempt with this class of machine.

(sgd.) ARNO B. CAMMERER,
Acting Director, National Park Service.

Approved, Dec. 28, 1922.

(sgd.) E. C. Finney,
First Assistant Secretary of the Interior.

This park was established for the benefit and enjoyment of the people, and to safeguard natural conditions within its boundaries in unimpaired form for present and future generations.

SUGGESTIONS FOR THE AMATEUR PHOTOGRAPHER.

To avoid streaks on the film, avoid heat and dampness in the handling of films and the loaded camera; and turn the winding screw slowly. Do not allow the camera to lie in the sun; and do not carry it where the heat from the automobile engine might affect it. Films should not be carried in the hip pocket as one's body temperature is too high for films.

The use of ray filters with the modern orthochromatic film is not advised as it slows up the exposure. This film is very sensitive to both light and heat and should be developed with the utmost care.

After the film has been removed from the camera it should be carefully wrapped, and if valued highly should be developed as soon as possible to insure against deterioration.

A common error is to photograph a geyser at high speed. Those in this book were made at a 25th of a second with the diaphragm at F 16 or F 22 (U. S. 16 or U. S. 32). The best effect is obtained with the sun at the side of the geyser. One should not attempt to make geyser pictures without the direct sunlight.

In photographing broad, well-lighted vistas like Yellowstone Lake and Mount Washburn, one 40th or 50th second is proper if the diaphragm is set at F 32 (U. S. 64). This insures sharpness and full time provided the lens is clean. Every two or three days it should be cleaned both inside and outside of the camera, without unscrewing it and running the

risk of throwing out the focus adjustment; breathe on the lens and wipe it gently with a soft handkerchief.

Average scenic films of the amateur are underexposed as the average person overestimates the speed of both his lens and film. When the object being photographed is stationary best results are obtained by using a very small diaphragm, say F 45.2 (U. S. 128), with an exposure of ½ to 1 second with good light conditions and with the camera resting absolutely stationary.

In the early morning and late afternoon the light appears stronger than it really is from the fact that the iris of the human eye is then larger than in strong light. This adjustment provided by nature is duplicated in the mechanism of the diaphragm of the camera. Pictures made in poor light with the wide open diaphragm must be carefully focussed to insure sharpness.

The terraces, pools, formations and paint pots may be successfully photographed if a side light is obtained, and the length of exposure and the size of the diaphragm are set the same as in photographing a geyser.

The forests of the Yellowstone are usually very dark in photographs, indicating underexposure. While distant scenes are usually light from overexposure. The average, successful amateur photograph is taken at a 25th of a second at F 16 (U. S. 16) in the park, provided light conditions are good. This applies whether one has a very fine lens and fast films, or an ordinary lens and ordinary films. The "speed" of lenses with the same diaphragm, whether anastigmat, rapid rectilinear or achromatic is no greater in one than another if they are new and clean. The difference in speed of the films is a matter for the laboratory tester and is hardly appreciable in practice.

In the above suggestions the usual don'ts have been omitted as it is assumed that the reader is familiar with his camera and has obtained good results under ordinary conditions.

The size of the diaphragm is indicated on some cameras by the "U. S." system and others by the foreign system, a comparison of which is given in the following table:

F. System		Universal System
F 7.5	is equivalent to	U. S. 3.5
F 8	is equivalent to	U. S. 4
F 11.3	is equivalent to	U. S. 8
F 16	is equivalent to	U. S. 16
F 22.6	is equivalent to	U. S. 32
F 32	is equivalent to	U. S. 64
F 45.2	is equivalent to	U. S. 128
F 64	is equivalent to	U. S. 256

HISTORICAL.

ALTHOUGH part of it was included in the great Louisiana Purchase of 1803, the Yellowstone Park was not then known to white men. Probably the first one who ever saw any of its hot springs or geysers was John Colter who left the celebrated Lewis and Clark Expedition, which was on its return to St. Louis, in 1806, and started for the headwaters of the Yellowstone River to trap and hunt. This lone adventurer passed northward in 1807 from the mouth of the Big Horn to the Forks of the Shoshone River where he discovered an immense tar spring; he continued on through a country where much hot spring and geyser phenomena exist and down the Yellowstone River to the ford at Tower Fall, thence out near the northeastern corner of what is now the National Park.

After four years of peril among the Indians and a miraculous escape from the hostile Blackfeet, he returned in 1810 to St. Louis. His wonderful tales were hard to believe and the place he described (which was thought to be the product of his imagination), was termed "Colter's Hell."

JOHN COLTER

1807

By Olin D. Wheeler.

In May, 1804, there left the village of St. Louis, a party of explorers bound for the mouth of the Columbia River. This exploration was planned by President Jefferson, and, after Congress sanctioned it, was placed in charge of Meriwether Lewis, Mr. Jefferson's private secretary. Lewis associated with him as an equal in command, his particular friend Captain Willian Clark, and this national adventure, as it may well be termed, is known as the Lewis and Clark Expedition. It traveled in small boats up the Missouri River and the Jefferson River, a continuation of the Missouri, to the limit of navigation; crossed the Rocky Mountains to the Clearwater River, on horses procured from the Shoshone Indians; navigated that stream and the Snake and Columbia rivers in canoes made by themselves from pine trees; spent the winter of 1805-6 near the present city of Astoria, Oregon, and returned

in 1806 by much the same route, reaching St. Louis in September, 1806, having most successfully accomplished its mission with the loss of but one man.

The party consisted of forty-five persons when it left St. Louis, the greatest care being used to obtain men specially fitted for the peculiar duties and dangers to be encountered. Men of strong, healthy bodies and alert minds were needed and, naturally, men well acquainted with border life in all its peculiar phases were chosen.

Aside from the leaders themselves, the man who achieved the most eminence was John Colter, and curiously enough it was the result of adventures and feats performed in the years immediately following the return of Lewis and Clark. His duties on that noted exploration were carried out satisfactorily to his chiefs, but he is entitled to no distinction in this respect above his fellow comrades.

When these explorers, on their return, arrived at the villages of the Mandan Indians near the mouth of Knife River, North Dakota, where they had wintered in 1804-5, they met two white men, trappers, on their way to the smaller tributary streams of the Yellowstone and Missouri rivers in the wilds of what is now Montana. The trappers offered Colter such inducements to go with them that he asked Lewis and Clark for his release, which was granted. He, accordingly, and before returning to the delights of frontier civilization, such as they were, buried himself once more in the wilderness for several years. This time was spent in trapping beavers and other animals, which then were most abundant in the mountain streams, for their furs which were extremely valuable. During this time Colter passed through the experiences and performed the exploits which have made him a historical character.

The man seems to have been a natural rover and adventurer. The lure of the plains and prairies and mountains, with their magnificent distances, marvelous mirages, beautiful vistas, unique and wonderful canyons, entrancing waterfalls, great rivers, alpine crags and peaks, cool, timbered plateaus, gorgeous sunsets and game dotted valleys and parks; to roam abroad in solitude, afar from the haunts of men, where boundless forests and pine and snow topped mountains enclosed him about, and wild beasts—bisons and elk and deer and bears and mountain lions ranged or made their lairs, seems to have just suited his temperament.

It is to be regretted that we have not a fuller and more detailed account of the adventures of this remarkable man after he ceased his connection with Lewis and Clark. He doubtless did recount to many individuals the experiences which befell him, but they were probably considered as not

at all unusual for the time and hence little or no attempt was made to preserve them. More likely, they were thought to be utterly beyond credence, and, so unworthy of preservation. The stories of these mountain men and plains wanderers were, in those days, received by the dwellers in the towns and settlements on the frontier with much disbelief, and many who did believe them were ridiculed for their credulity. But some of his stories were told to men who appreciated their historical value. To John Bradbury, an English naturalist, and Henry M. Brackenridge, a traveler and writer, we are indebted for such knowledge as we have regarding Colter after 1806.

As the late General H. M. Chittenden well says, the glimpses of Colter's record as given by these two men "clearly indicate that he was a man of superior mettle to that of the average hunter and trapper."

While "these glimpses" are fragmentary they justify General Chittenden's statement, but they leave much unrevealed as to Colter's movements. He and the two trappers apparently wintered during 1806-7 on the Yellowstone River or some one of its tributary streams. At that time these streams abounded with beavers.

In the summer of 1807 some reason not definitely known, impelled Colter, whether alone or in the company of Crow or other Indians, is not known, to make an extended journey into territory not covered by Lewis and Clark, but adjacent thereto. In doing this Colter, without knowing it, made the discovery, of world interest, which alone would have immortalized him on the pages of history. This discovery, fortunately, for the world, attracted no particular attention for more than sixty years. This was owing to the fact, before stated, that the tales of these mountaineers and adventurers were so largely disbelieved, and were forgotten almost as soon as told. **Colter in his wanderings of 1807 discovered the marvelous region now known as Yellowstone Park.** There can be no dispute as to this because Lewis and Clark in their voluminous report of their expedition which did not appear until 1814, in a map of the Rocky Mountain region show **"Colter's Route in 1807,"** the trail being distinctly marked.

Colter's trail has been the subject of some discussion. He evidently started from, and returned to, his camp on Pryor's Fork, or creek, in Montana. He crossed the various detached ranges of the Rocky Mountain chain between the headwaters of Wind River and those of the Snake River, passing around the southern end of Jackson Lake, Wyoming. Then traveling north he soon recrossed the mountains, north of Jackson Lake, to Yellowstone Park, skirted the west side of Yellowstone Lake, followed, evidently, the well known lower

Mt. Washburn trail along the rim of the Grand Canyon to Tower Fall, forded Yellowstone River at that point, and then returned to his starting point.

Colter on this trip visited none of the large geyser basins judging from his trail. Besides Lakes Jackson and Yellowstone and the Grand Canyon, Colter must have seen Lewis and Shoshone Lakes, the paint pots, hot springs and small geysers at the West Arm of Yellowstone Lake, the three falls at the head of the Grand Canyon and many of the hot pools and mud springs found along his route and particularly those between and about the Grand Canyon and Tower Fall. He may have visited Mammoth Hot Springs, as a point marked "Hot Springs, Brimstone," across the mountains north of the Grand Canyon, may stand for that interesting locality with its wonderful nature painted terraces, hot pools and caves.

This, in brief, rehearses the story of the now historic trail and discoveries of this hardy, intrepid ranger of the wilds, when the outposts of civilization and border settlement were a thousand miles to the eastward. To fill in the details, the days of toil and fatigue, of burning heat and drenching storms, of thirst and hunger, danger from wild beasts and accident—these the imagination must picture.

JAMES BRIDGER

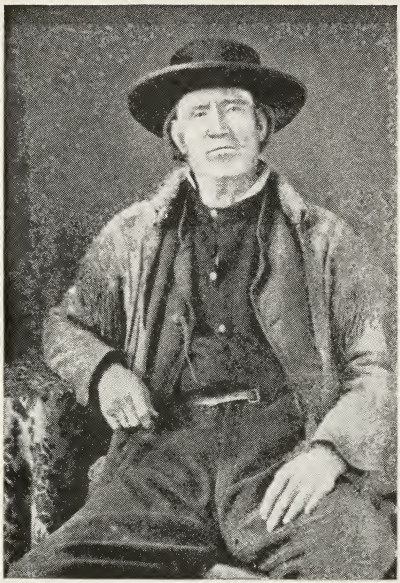
1830

By Olin D. Wheeler.

Among the many men engaged in the old frontier life, none achieved a wider, more enduring and deserved reputation for all that such a life demanded, than did the redoubtable James Bridger.

The story of his career well illustrates what the life of that class of men was, the hardships they encountered and how they endured them, the rude border surgery practiced, the dangers to which they were hourly exposed, their bravery and resourcefulness, the distinguishing abilities disclosed now and again, by conspicuous examples in, perhaps, most unexpected ways, and the suddenness with which death came to so many of them.

Bridger was a native of Virginia, and was born in Richmond in 1804. His father is said to have been a farmer and also a hotel keeper in Richmond. When young James was about eight years old the family migrated to Missouri, near St. Louis, where the father followed the calling of surveyor. The mother died in 1816, and the father in 1817, leaving two children, James and a sister, who were cared for by an aunt



JAMES BRIDGER 17476

who later became the wife of John Tyler afterwards President of the United States. The latter, therefore, became an uncle to Bridger by marriage. James, after his father's death supported his sister and himself. At one time he ran a flatboat ferry and again he was apprenticed to the blacksmith's trade.

In 1822 he began the career which was to make him famous among the daring and historical characters of the west. In that year he became one of a band of trappers in the employ of the Rocky Mountain Fur Company, under General W. H. Ashley, one of the most noted of the men who organized and directed the American Fur Trade of those days.

Bridger was one of the discoverers of the celebrated South Pass of the Rocky Mountains. The Pass lies on the Continental Divide in Wyoming.

It became one of the most widely known and important geographical features of the Rocky Mountain chain. It was directly in line with the westbound route, or Oregon trail as it was generally called, up the Platte River from the East, to Fort Hall, Idaho, and the North Pacific Coast.

The winter of 1823-24 found Bridger in Utah. So far as is actually known he that winter became the sole discoverer of Great Salt Lake.

Bridger was one of the first men, after John Colter, to see and tell others about Yellowstone Park. This was of

course, long before the park was established or the public at large knew anything about that now world famous locality. Just when Bridger first explored this mysterious region is not actually known. It would appear that it was at a very early period, probably about 1830, perhaps earlier, and that he certainly visited the region more than once for he was, unquestionably, thoroughly acquainted with its unusual character, and was ever ready to talk about it and recount its wonders.

So true was this and so skeptical were the people of that day to believe anything that seemed out of the ordinary, that Bridger, with his stories about the geysers and hot springs, the wonderful canyons and waterfalls, etc., obtained the reputation of being the champion prevaricator of his time. The newspapers of the frontier absolutely refused to print his tales for fear of being laughed at and ridiculed.

All this disbelief aroused, not unnaturally, the ire of "the old man of the mountains," and he concluded that he would live up to the reputation placed upon him.

It has been well said that then "He did not hesitate to 'guy' the unsophisticated."

Near the southeast corner of Yellowstone Park and not far from the present park boundary, is one of Nature's most remarkable productions particularly from a geographic standpoint. It is known as Two Ocean Pass and comprises two small streams, Pacific and Atlantic creeks, flowing into each other in such a way that water from each one passes into both the Atlantic and Pacific oceans. This very interesting spot was also discovered and made known to the world by Bridger. Aside from the geographic fact mentioned Two Ocean Pass is interesting in another way. It was early noted that in all the streams in Yellowstone Park having falls, with one exception there were plenty of trout below the falls, the latter proving obstacles that the trout could not surmount, and, therefore, no fish were found above the numerous falls. The one exception noted was the Yellowstone River, the largest stream of all and with two high falls near together and impossible for trout to overleap. Here there were trout above as well as below the falls. For a long time the question as to how the trout happened to be found in the upper river waters, was a puzzling problem. Finally it was discovered that at high water small trout native to Pacific Coast waters were able to go through the Two Ocean Pass into Yellowstone River and Lake above the two high cataracts near the Grand Canyon, where they are found today.

Just north of the junction of Atlantic Creek and Yellowstone river is a small lake named in honor of this mountaineer, Bridger Lake.

In 1865-6 Bridger was connected with the late General G. M. Dodge, Chief Engineer of construction of the Union Pacific Railway, as scout and guide. General Dodge conceived a strong liking and admiration for the old plainsman and, after the death of the latter, finding that his remains were interred on his farm and the grave was being neglected, he obtained a beautiful burial site in Mount Washington Cemetery, Kansas City, had the remains removed thereto, and erected a fine monument over them suitable to the character and achievements of the man. The writer made a special visit to this cemetery and grave some years since and was glad indeed to see that the noted old trapper and mountaineer had found such a beautiful resting place, at the end of his long, rough life journey.

General Dodge, who himself but recently passed away, published a pamphlet recounting in some detail the life history and adventures of this remarkable frontiersman.

"I found Bridger," he says, "a very companionable man. In person he was over six feet tall, spare, straight as an arrow, agile, rawboned and of powerful frame, eyes gray, hair brown and abundant even in old age, expression mild and manners agreeable. He was hospitable and generous, and was always trusted and respected. He possessed in a high degree the confidence of the Indians. He was one of the most noted hunters and trappers on the plains.

"While engaged in this thorough system of trapping, no object of interest escaped his scrutiny, and when once known it was ever after remembered. He could describe with the minutest accuracy places that perhaps he had visited but once, and that many years before, and he could travel in almost a direct line from one point to another in the greatest distances, with certainty of always making his goal."

Major Bridger was three times married, each time to an Indian woman. His first wife was the daughter of a Flathead, or Selish, Indian chief and she died in 1846, leaving two children, who were sent to St. Louis to school. The second wife was a Ute Indian woman. She died in 1849, leaving a little baby that was brought up on the milk of a buffalo, or bison, and grew to womanhood and married. In 1850 Bridger married a Snake, or Shoshone, woman who died in 1858, leaving two children.

The end came on July 17, 1881, at 77 years of age. And what crowded, eventful years they had been where he had trailed and camped and feasted and starved, and roughed it in every conceivable fashion, and fought Indians and Whites. He passed away at just the right time for the old west as Bridger had known it—was also gone.

And what a change in the Yellowstone of Colter and Bridger! During their lives no one would believe their wonderland stories. Now, the Yellowstone, the first and precursor of all our National Parks, is visited each season by nearly 100,000 persons, from all parts of the world—"Sic eunt fata hominum."

The Park had been described in part by some of the early hunters, but their knowledge of the place was limited, due to the fact, no doubt, that the region was so difficult to explore; and it is a fact worthy of note that until 1842 no written description of these geyser regions had ever appeared. But in that year the first description of the geysers was seen in print.

Who the author of the article was was unrevealed. In the year 1900, however, Mr. Olin D. Wheeler, of St. Paul, the author of the well-known "Wonderland Series of the Northern Pacific Railway" and of "The Trail of Lewis and Clark," discovered the identity of the writer. He was Warren A. Ferris of the American Fur Company, whose early home had been in western New York. In 1834 with two Indians he visited one of the geyser areas, it is not definitely known which, and wrote the description noted which was first printed in the Western Literary Messenger of Buffalo, in July, 1842, from which the Wasp, a Mormon paper of Nauvoo, Illinois, copied it without giving credit to the Messenger. Ferris died near Dallas, Texas, in 1873.

WARREN ANGUS FERRIS

1834

By Olin D. Wheeler.

Closely following the discoveries and knowledge of the park region gained by Bridger, and his imaginative and extravagant tales of it, exaggerated for a purpose, the third member of the Human Triangle Heroic made the visitation which in time has immortalized him. But, it was long ere the identity of this individual was ascertained.

On August 13, 1842, the Wasp, a Mormon newspaper of Nauvoo, Illinois, the locus of the Mormon people prior to the migration to Utah, published an article by an unknown writer recounting his journey to, and observations on, the geysers and hot springs in the western part of the park region. "And

now doth time waste" itself, for the story of these wonders, probably largely disbelieved, passed into oblivion and not until full thirty years later was it resurrected and made a part of the recognized literature of the park. And still no hint of the personality of the explorer and litterateur.

Then Fortune was, indeed, kind to the present writer. A friend interested in the park informed me of an article incidentally seen by him, which I at once surmised was the Wasp production here mentioned, which was unknown to my informant. Curiosity was piqued when the publication containing the dissertation was found to be an eastern one.

A few days later Volumes II and III of the Western Literary Messenger of 1842-44, published in Buffalo, N. Y., were handed to me and lo! there, in the issue of July 13, 1842, was the original story as printed by the Wasp, but without showing the authorship. The reprint by the Wasp, therefore, without even giving credit to the Messenger, necessarily was shown without the writer's name because it was unknown to the Wasp.

Continuing to examine the files of the Messenger, it was found that it published from time to time other excerpts from the same manuscript entitled "Life in the Rocky Mountains," the author still unnamed. In the issue of January 11, 1843, the husk was broken and the kernel of the nut revealed, as it were. "At last it came"—the title page of the production, the author, the serial text—title, name and all.

"An author! 'Tis a venerable name!" which may or may not "Names forever memorize." What was this monograph of the far distant "Rocky Mountain" region predestined to do —immortalize the man and gratify and edify the reader, or the reverse?

The title as recorded by the Messenger was:

"LIFE IN THE ROCKY MOUNTAINS. A DIARY OF WANDERINGS ON THE SOURCES OF THE RIVERS MISSOURI, COLUMBIA AND COLORADO, FROM FEBRUARY, 1830, TO NOVEMBER, 1835. BY W. A. FERRIS, THEN IN THE EMPLOY OF THE AMERICAN FUR COMPANY."

Here then was a real resurrection of a more or less valuable product of ancient exploration, relatively, and as well, perchance, that of a literary disquisition.

Eight years after viewing those remarkable manifestations of Mother Nature the story of Ferris, with his authorship shown, was given to the world. But the time of its resurrection was not a propitious one, and ere long its publication ceased and, until the writer rediscovered it, for almost sixty years it had reposed in a state of "innocuous desuetude."

From bound volumes of the Messenger, kindly forwarded to me by one of the Buffalo Libraries, and correspondence

with members of the Ferris family at Buffalo, I was able to develop something of the life of our third member of the Human Triangle Heroic.

Warren Angus Ferris, of Quaker parentage, was born at Glens Falls (presumably), N. Y., December 26, 1810. About the beginning of the War of 1812, his parents removed to Erie, Pennsylvania, where his father, Angus Ferris, became one of the earliest owners of vessels on the Great Lakes and was engaged in furnishing supplies to the American army. The father died at Erie, September 10, 1813, the day of Perry's victory at Put-in-Bay, and in 1814 the widow and her two children removed to Buffalo, New York.

Ferris received a good education for that day as a civil engineer. Upon returning from the Rocky Mountain country he removed to Reinhardt, Texas, married and raised a family, and died in 1873 at the age of sixty-three years.

He followed his engineer's calling in Texas and attained to worthy eminence among the people.

His life among the mountains never lost its hold upon him, which, those of us who have passed through the same experiences in one way or another that he did, easily understand.

The two principal claims to distinction that Ferris possesses in connection with the history of Yellowstone Park, are first, that he was, unlike Colter and Bridger, a well educated man for that day. Second, that he was the first person to write and have published a descriptive tale of the region, its hot water reservoirs and fountains. And this, be it remembered, was at a very early period in the history of the west; before Whittier, who could have visioned, could not yet hear, "The Tread of Pioneers" and the "First Low Wash of Waves" which was soon to "Roll a Human Sea" over the wide and wandering game dotted plains and forest canopied mountains, of that "One Stupendous Whole Whose Body Nature Is."

This Human Triangle Heroic—Colter, Bridger, Ferris, as "Time, the beautifier of the dead" continues in the future to "roll his ceaseless course" along, deserve at least the reasonable respect and acclamation of American humanity and history.

Simple and unlearned, for the most part, "rude forefathers of the hamlet," as present or future generations may look upon them, each and all three filled, in their time, and as God had fashioned them, a niche of life and history that many a man far more learned in book lore and knowledge as the world looks upon it, would give a large stake, to pass across the last divide so worthily and deserving the "well done," as

did they. Of each one, indeed, I trust it is "Requiescat in Pace."

Captain W. F. Raynolds' Expedition could not penetrate the region when it attempted to explore it in 1860, on account of the snow encountered; the party encircled it however and learned much from the tales of hunters and trappers who had visited it. Captain Raynolds in his report on the "Exploration of the Yellowstone" in 1859-60 states regarding the "Munchausen Tales" about the Park:

"One was to this effect: 'In many parts of the country petrifactions and fossils are very numerous, and, as a consequence, it was claimed that in some locality (I was not able to fix it definitely) a large tract of sage is perfectly petrified, with all the leaves and branches in perfect condition, the general appearance of the plain being like that of the rest of the country, but all is stone; while the rabbits, sage hens and other animals usually found in such localities are still there, perfectly petrified, and as natural as when they were living; and, more wonderful still, the petrified bushes bear the most wonderful fruit; diamonds, rubies, sapphires, emeralds, etc., etc., as large as black walnuts, are found in abundance.' "

Captain John Mullan mentions the Park geysers in his report to the government in 1863 and states that he visited them.

The following is taken from the report made to the late Dr. F. V. Hayden, chief of Geological Survey of Territories, by Henry Gannet, E. M., on the geographical field work of the U. S. Geological Survey during the season of 1878:

"The story of the remarkable fruit borne by these stone trees is not far from correct, the main difference between the story and the fact being that the fruit is borne on the outside and inside of the trunk of the trees, instead of on the ends of the branches. The mineral species are not as given in the story, either, but this is a matter of no vital importance. In the process of the silicification of wood the last result of all is the production of quartz crystals. The trunk is converted totally into crystaline quartz, radiating from within outward, the crystals being all crowded out of shape. The inside and outside of the hollow cylinder of quartz, which represents the former tree, are covered with the characteristic quartz pyramids. Such products of silicification are very

abundant in the Park, particularly on Amethyst Ridge, and are, undoubtedly, the stone fruit of the petrified trees and bushes. The crystals are colorless, amethystine or yellow, and according to the color, are known to the mountain men as diamonds, amethyst, topaz, etc. It is unnecessary to say that the part of the story relating to animal life was manufactured from the whole cloth.

"In 1863, Captain W. W. DeLacy, in command of a large party of prospectors, left Montana to prospect on the upper waters of the Snake. Striking that river near the junction of Henry's Fork, they followed up the main river through the canyon, prospected in Jackson's Hole, and, not finding gold in paying quantities they broke up the party, some returning one way, some another. Captain DeLacy, with a portion of the party, followed up the Snake and Lewis Fork, discovering Lewis and Shoshone (DeLacy's) Lakes, the Shoshone and the Lower Basins. The geographical work done by Captain DeLacy on this trip was embodied in a map of Montana, drawn by himself, and published by authority of the territory in 1864-65, and the material thus made public was afterwards used by the land office in the compilation of maps of that region.

"The results of this trip seem to have attracted little or no attention, for we hear of no one going into the country until 1869, when the prospectors, Cook, Folsom and Peterson, made a prospecting tour through the park. They followed the Yellowstone up to the mouth of the East Fork, then up the latter stream for a few miles, crossing over to the Yellowstone at the Great Falls; thence they went up this stream to the foot of the lake and around the east side of the latter to the extremity of the west arm; thence crossing over to Shoshone Lake and Lower Geyser Basin on the Madison or Firehole, and finally left the country by following down the Madison River."

Their story, written by C. W. Cook and David E. Folsom, and published in the Chicago Western Monthly for July, 1870, immediately attracted attention. C. W. Cook, who attended the semi-centennial celebration of the establishment of the Yellowstone held in 1922 at National Park Mountain, states regarding changes noted since his trip of 1869 as follows:

"In visiting the park after an absence of fifty-three years, I find considerable changes. The Mud Volcano is absolutely changed, its activity now being unworthy of much attention. At that time it was so active that it was almost impossible

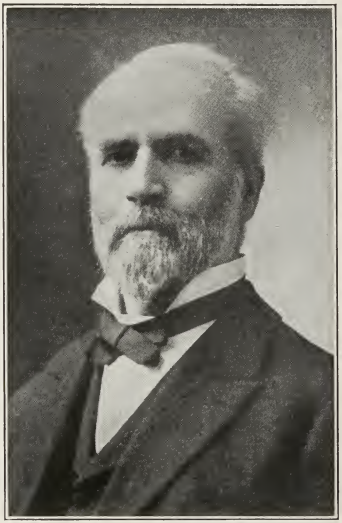
for us to sleep in our camp on the river almost half a mile away. The features at the Thumb have become so changed that they are of less interest now. We did not see the Excelsior Geyser in the Lower Geyser Basin in action while we were there in 1869, but at that time the crater appeared to be much smaller than now, and was full and overflowing with boiling hot water."

The following summer, 1870, a party, composed of prominent citizens of Montana, under the leadership of General Washburn, then Surveyor General of Montana, was made up for the purpose of exploring this region. Among the party were N. P. Langford, first superintendent of the Park, Cornelius Hedges, T. C. Everts, S. T. Hauser and Lieut. G. C. Doane.

Mr. Olin D. Wheeler, of St. Paul, author and historian, in speaking of N. P. Langford's "The Discovery of Yellowstone Park, 1870," (published by J. E. Haynes, St. Paul), says:

"In 1870 the Washburn party, escorted by a small contingent of U. S. Cavalry, ventured into the untrailed wilderness and mountain fastnesses now known as Yellowstone National Park. Adventures and hardships of varying sorts befell them; a near-tragedy and possible death afflicted them. They returned from a month's wanderings to electrify their countrymen with their tales of what Nature, unknown to us, had so marvelously accomplished through fire and ice in the long ago.

"Nathaniel P. Langford, my esteemed friend of years, who so recently followed the winding trail across the Shadowy Divide, was the diarist of the party, who, most assiduously,



NATHANIEL P. LANGFORD 17477

and with a blessed prescience, chronicled in this narrative faithfully and in detail, the heroism and success of these explorers. Descriptively and historically the story stands out in the park literature even as Langford stood out among his fellow men, to the end.

"To the Washburn party we owe the establishment of the park in 1872; and one who desires to have a knowledge of the park in its entirety misses much if he does not possess this unpretentious but classic narration."

Many of the prominent features of the Park were named by this party—Mount Washburn, the famous promontory, Old Faithful, the Castle and Beehive Geysers, National Park Mountain, and many other points of interest.

While near Yellowstone Lake, Mr. Everts strayed from the party and was lost in an almost impenetrable country. After a diligent but unsuccessful search for him the party was forced to continue their journey.

In the meantime Mr. Everts had been overtaken by a severe storm and while searching on foot for evidence of a trail, lost his eye glasses and was unable to return to his horses. Thirty-seven days later he was found by Jack Barronette in a starved and half demented condition crawling on his hands and knees. Happily he fully recovered from his unfortunate experience.

Expeditions in 1871 under Dr. F. V. Hayden of the United States Geological Survey, and Captains Barlow and Heap of the Engineer Corps of the Army resulted in the discovery of Mammoth Hot Springs and the route from the Lower Basin to the Yellowstone River. A map of the outline of the Yellowstone Lake was made, and collections of specimens were gathered throughout the region. The reports which followed were very complete.

Until 1872, the region was open to settlers without restrictions on hunting, trapping, gathering specimens and the fencing-in of the geysers for private gain. To avoid these dangers the region was set aside as a National Park, March 1, 1872, when President Grant affixed his signature to the Act of Dedication.

THE ACT OF DEDICATION OF YELLOWSTONE NATIONAL PARK.

Approved March 1, 1872.

BE IT ENACTED BY THE SENATE AND THE HOUSE OF REPRESENTATIVES OF THE UNITED STATES OF AMERICA IN CONGRESS ASSEMBLED:

That the tract of land in the Territories of Montana and Wyoming, lying near the headwaters of the Yellowstone River, and described as follows, to-wit: Commencing at the junction of Gardiner River with the Yellowstone River, and running east to the meridian passing ten miles to the eastward of the most eastern point of Yellowstone Lake; thence south along the said meridian to the parallel of latitude passing ten miles south of the most southern point of Yellowstone Lake; thence west along said parallel to the meridian passing fifteen miles west of the most western point of Madison Lake; thence north along said meridian to the latitude of the junction of the Yellowstone and Gardiner Rivers; thence east to place of beginning—is hereby reserved and withdrawn from settlement, occupancy or sale under the laws of the United States, and dedicated and set apart as a public park or pleasure ground for the benefit and enjoyment of the people; and all persons who shall locate, settle upon or occupy the same or any part thereof, except as hereinafter provided, shall be considered trespassers and removed therefrom.

Sec. 2. The said public Park shall be under the exclusive control of the Secretary of the Interior, whose duty it shall be, as soon as practicable, to make and publish such rules and regulations as he may deem necessary and proper for the care and management of the same. Such regulations shall provide for the preservation from injury or spoliation of all timber, mineral deposits, natural curiosities or wonders within said park and their retention in their natural condition.

The Secretary may, in his discretion, grant leases for building purposes, for terms not exceeding ten years, of small parcels of ground, at such places in said park as shall require the erection of buildings for the accommodation of visitors; all the proceeds of said leases, and all other revenues that may be derived from any source connected with said park, to be expended under his direction, in the management of the same, and the construction of roads and bridle paths therein. He shall provide against the wanton destruction of the fish and game found within said park, and against their capture or destruction for the purpose of merchandise

or profit. He shall also cause all persons trespassing upon the same after the passage of this act to be removed therefrom and generally shall be authorized to take all such measures as shall be necessary or proper to fully carry out the objects and purpose of this act."

In 1873 Captain W. A. Jones took a large party through the Park. He entered it from the head of the Stinking Water, crossing one of the many passes near Mt. Chittenden. After visiting most of the points of interest in the Park he left via the Upper Yellowstone, on the way verifying the old trapper's legend about the "Two Ocean River," and discovering a practical pass (Two-Gwo-Tee), and route from the south to the Park. This discovery was by far the most valuable result of the expedition.

In 1875 Captain William Ludlow, U. S. A., in charge of a reconnaissance in Central Montana, made a flying trip to the Park. He developed little that was new save more accurate measurements of the Upper and Lower Fall of the Yellowstone.

General O. O. Howard crossed the Park in his famous pursuit of the Nez Perce Indians in 1877; the year that P. W. Norris was made superintendent to succeed N. P. Langford who had held that office five years. Mr. Langford did more for the Park than can be reckoned; he served as superintendent without pay or remuneration of any kind and had upheld the "National Park Idea" from the

CHIEF JOSEPH, NEZ PERCE 13452

THE SKIING PARTY AT OBSIDIAN CLIFF 11018

time the Expedition of 1870 talked of the plan until the Act of Dedication was finally passed in 1872.

The United States Geological Survey resumed work in the Park in 1878 under Dr. F. V. Hayden; and in 1883 a report was published giving detailed descriptions of the points of interest, as well as scientific discussions of the phenomena observed. This report is beautifully illustrated with color-plates, engravings, diagrams and maps.

In August, 1883, President Arthur with the Secretary of War, Lieutenant-General Sheridan of the Army, Senator Vest, and several other distinguished officers and civilians visited the Park in the most elaborate pack-train expedition that has ever been enrolled. The route lay from Green River on the Union Pacific R. R., to Livingston on the Northern Pacific Railway.

F. Jay Haynes, at that time Official Photographer of the Park, procured many interesting photographs of the party and the places they saw on this famous expedition.

WILD BUFFALO HERD 10133

Winter Exploration in 1887.—In January, 1887, the first successful winter exploration of the Yellowstone region was made. Lieutenant Frederick Schwatka of Arctic fame headed the party consisting of several eastern men, F. Jay Haynes, photographer, and a corps of guides, packers and assistants. Their outfit consisted of astronomical instruments, photographic equipment, sleeping bags and provisions which were drawn on toboggans; the party used Norwegian skis and Canadian web snowshoes, but the snow was so light that they sank readily and the toboggans were exceedingly difficult to draw. It took three days to cover the twenty miles from Mammoth Springs to Norris Basin; and the temperature the first night at Indian Creek was 37° below zero.

Unfortunately Lieut. Schwatka fell ill at Norris and was unable to proceed. Mr. Haynes, desirous of obtaining a collection of winter photographs of the Park, employed two of the sturdiest men of the Schwatka party, and with Edward Wilson, a government scout, resumed the journey.

FIRST SIX-HORSE STAGE COACH AND OLD MAMMOTH HOTEL 11250

The toboggans were abandoned and this party packed their equipment and provisions on their backs—each man carrying about forty-five pounds.

Norris Basin was a gorgeous sight. Craters heretofore unnoticed by these men familiar with the Park in summer, steamed conspicuously. The foliage was heavily laden with ice near the steam vents and geysers, producing all the fantastic forms possible to imagine; while the entire basin resembled a vast manufacturing centre.

Tall trees buried in the snow appeared like bushes, and the general aspect of the country was completely changed; the average depth of the snow being about eight feet.

The steam rising fully two thousand feet from the geysers at Upper Basin could be seen from the Lower Basin.

The beautifully colored walls of the Grand Canyon were masses of pure white. The north half of the Great Fall hung in immense icicles 200 feet in length. An ice bridge fully 100 feet high was formed at the base of the fall, coming up to the spray line (about one-third the

THE POACHER (RIGHT), HIS DOG AND CAPTORS 16615

height of the fall). The brink was frozen over and was hidden in an arch of ice a dozen feet thick.

Thousands of elk were seen on the exposed ridges of Mt. Washburn. The trip over Mt. Washburn was one of most unusual hardship and privation; a blinding snowstorm which lasted four days overtook the party of four. During this entire time they wandered day and night without shelter, provisions or fire before reaching Yancey's ranch, an experience that nearly cost them their lives.

The circuit covered was about 200 miles, and the thermometer ranged from 10° to 50° below zero during the twenty-nine days of the trip.

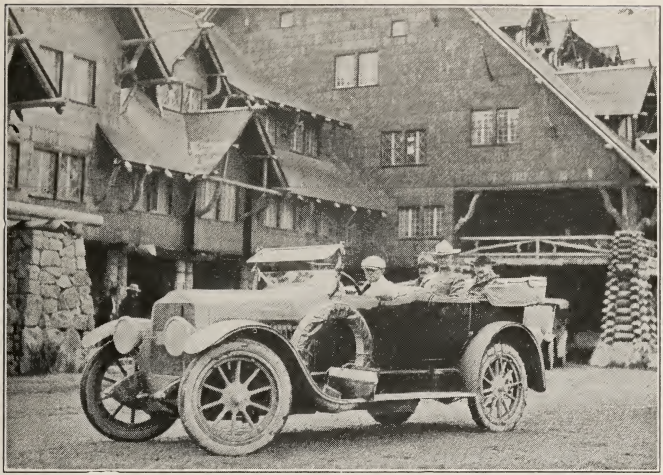
Winter Expedition of 1894.—Early in March, 1894, a party was organized at Fort Yellowstone to visit the winter ranges of the animals, to ascertain the number of buffaloes and photograph them. The party consisted of Captain Scott, Lieut. Forsyth, Scout Burgess, Robert Burns, Photographer Haynes, and three non-commissioned officers. On Norwegian snowshoes, with packs of sleeping bags, provisions and camera, they proceeded directly to

THE FORERUNNER OF THE AUTOMOBILE STAGE

Hayden Valley via Norris and the Grand Canyon. They found eighty-one buffaloes in the valley, seventy-three in one herd; and numerous groups of elk. After several days in Hayden Valley the party went to Yellowstone Lake. Captain Anderson, superintendent of the Park, had instructed Scout Burgess not to overlook the country east of the lake, as a small herd of buffaloes usually wintered there. The first day out from the lake they pitched camp about twelve miles up Pelican Creek.

Emerson Hough, eminent writer, and Billy Hofer spent many days in the park at the same time—the two parties met at the Canyon.

The second day they discovered the "cache" of a poacher, very much to their surprise. It consisted of a canvas tepee, sleeping bag, provisions and toboggan and six buffalo heads suspended in a tree. A trace of fire in the tepee led them to believe that the poacher was in the vicinity, and to capture him was the next move. As it had been snowing constantly all snowshoe tracks lead-

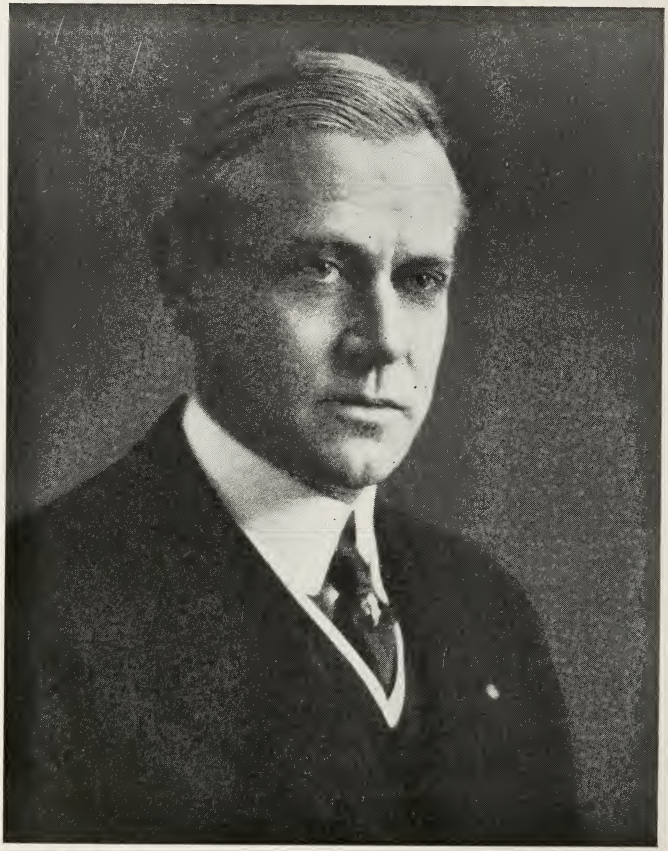


ONE OF THE FIRST AUTOMOBILES TO ENTER THE PARK 10213
AUGUST 1ST, 1915

ing from the camp were obliterated. Some five miles from the camp, however, they heard five or six rifle shots in rapid succession. Hastening through the timber to an opening they came directly upon the poacher. He had driven six of the buffaloes into the deep snow and slaughtered them all. Fortunately it was snowing hard, and the approach of the scout was not noticed by the poacher or his dog until the arrest was made. He was taken to the Lake Hotel and from there to the guard house at Fort Yellowstone. In addition to the twelve buffaloes that were killed by this poacher a small herd of seven was seen in the Pelican Creek country, making less than 100 then in the Park. Elk were seen in great numbers in the foothills of Mt. Washburn, on Specimen Ridge, along the east fork of the Yellowstone, on Slough Creek and the Yellowstone River to Mt. Everts. Small bands of mountain sheep, deers and antelopes were seen on Mt. Everts. The open water of the Yellowstone be-

tween the lake and falls was alive with ducks and swans. Red foxes and coyotes were numerous and an occasional black fox and footprints of mountain lions and bears were seen. The party in about thirty days traveled over 300 miles.

Harris & Ewing



STEPHEN T. MATHER

Stephen T. Mather first entered the Department of the Interior on January 21, 1915 as Assistant to the Secretary, Franklin K. Lane, who prevailed on him to relinquish the active management of his private business and take a public office. The urgent need for an organization to assume control incident to managing the steadily growing system of National Parks was evident to both Secretary Lane and Mr. Mather who both worked toward the establishment of the **National Park Service,** which was created by an act of Congress, signed August 25, 1916, by President Woodrow Wilson.

Mr. Mather resigned as Assistant to the Secretary to accept the commission of Director of the National Park Service on April 19, 1917. In 1915 when Mr. Mather first became interested in the management of the National Parks there were 12 National Parks and 18 National Monuments. Since that time several National Parks have been added—Rocky Mountain, Hawaii, Lassen Volcanic, Mount McKinley, Grand Canyon, Lafayette and Zion; and following National Monuments—Dinosaur, Capulin Mountain, Verendrye, Katmai, Scotts Bluff, Yucca House, Fossil Cycad and Aztec Ruin.

The National Park Service has jurisdiction over 13,190 square miles of land in which are situated the greatest natural spectacles and the most wonderful scenery in the United States.

The life and activities of **Frank Jay Haynes,** who passed away on March 10th, 1921, at the age of 68 years, makes an important chapter in the history of Yellowstone National Park.

In 1881, before the Northern Pacific Railway was completed, he drove with horses overland from Bismarck, North Dakota, to the Yellowstone. After making the entire circuit of the Park with his camera he returned with photographic proof that the reports of that wonderful region, brought back by trappers and explorers, had not

F. JAY HAYNES IN HAYDEN VALLEY IN 1887 16606

been exaggerated. In August, 1883, as photographer, he accompanied the distinguished party which included President Arthur, his Secretary of War, Senator Vest, Governor Crosby of Montana, and other prominent men. Later as Official Photographer on two occasions (1887 and 1894), he braved the severe cold and hardships of winter travel in the Park, making extensive trips on skis to secure winter pictures of the animals and natural phenomena.

His closer identification with the Park began in 1884 when he received a concession to conduct a photographic business in the Park, which he held continuously for thirty-two years, until his health began to fail in 1916, when his business was transferred to his son, Mr. J. E. Haynes. In 1898, foreseeing the future possibilities of development of the Western entrance to the Park as a tourist thoroughfare, he organized the Monida & Yellowstone Stage Company, and secured a franchise to operate regular stages through the Park entering from the west. For ten years tourists were taken from the railroad at Monida, Montana, and brought by this stage company for fifty-five miles to

PRESIDENT ARTHUR'S PARTY AT UPPER BASIN, AUGUST, 1883

STANDING—Reading from left—Col. Mike Sheridan, U. S. A., Gen. Anson Stager, Capt. Philo Clark, U. S. A., Judge Rawlins, Col. J. F. Gregory, U. S. A.
SITTING—Reading from left—Gov. Schuyler Crosby, Mont., Gen. P. H. Sheridan, U. S. A., President C. A. Arthur, Secretary of War Robt. T. Lincoln, Senator Geo. G. Vest.

the Park. On the strength of his demonstrating the feasibility of this entrance the Union Pacific Railway in 1907 built a branch line to the Western Boundary, and in 1914 the name of his line was changed to the Yellowstone-Western Stage Company. This entrance has since become even more popular than the Gardiner Gateway, 20,151 tourists having been transported by this company in a single year, 1915. This company was dissolved following the close of the season 1916 when a new transportation company was formed to take care of rail passengers from all entrances and permitted to use automobiles in place of the horse-drawn stages.

In 1920 Mr. Haynes completed his fortieth consecutive season in the Yellowstone, a record of continuous service and accomplishment without parallel in the history of the development of America's National Parks. His splen-

COLONNADE FALLS, BECHLER RIVER—UPPER 35 FEET, LOWER 67 FEET
Copyright by William C. Gregg

did photographs of the Park scenery have been widely distributed all over the world for many years, and their influence in bringing the Yellowstone into its present prominence is beyond estimate. With his death the Park has lost one of its oldest, most unselfish and sincerest friends.

Away from the beaten path in the southwest corner of the park are hot springs, lakes, canyons, meadows and a group of falls and cascades of surprising extent and beauty. Moose, elk and deer graze undisturbed in large natural pastures. Trout abound in the many streams.

This area has been termed the **Cascade Corner** of the park. Batchelder Column, Bechler Falls, Cascade Acres, Cave Falls, Dunanda Falls, Ferris Fork, Gwinna Falls, Littles Fork, Phillips Fork, Quiver Cascade, Ragged Falls, Silver Scarf Cascade, Sluiceway Falls, Tempe Cascade, Tendoy Falls, Three River Junction, Treasure Island, Twister Falls and Wahhi Falls are the approved names for the heretofore unnamed features in the Cascade Corner of Yellowstone National Park as decided by the U. S. Geographic Board in March, 1922. The

BECHLER FALLS, BECHLER RIVER 21113

Board also approved the following names: Bechler River, Terraced Falls and Union Falls.

Other prominent features already named, as shown on the U. S. Geological Survey map are Iris Falls, Colonnade Falls, Ouzel Falls and Rainbow Falls.

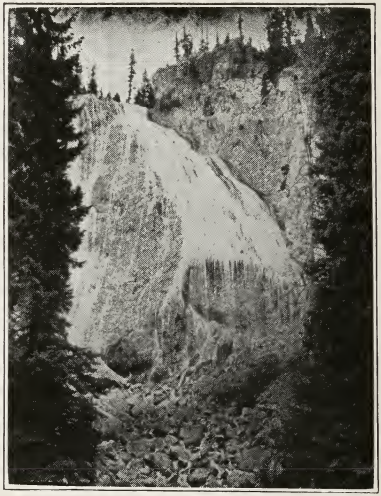
Batchelder Column was named for Amos G. Batchelder, Dunanda means Straight Down, Ferris Fork was named for Warren Angus Ferris early Yellowstone explorer, Gwinna means Eagle, Phillips Fork was named for William Hallett Phillips staunch friend of the Park, Tempe means Cavern, Tendoy was named for a Bannock or Shoshone Indian chief, and Wahhi means double. Ouzel Falls was named for the American water ouzel, a small bird that frequents the region.

The majority of these names were suggested by Mr. Wm. C. Gregg who headed expeditions into the Cascade Corner in 1920 and 1921. Ferris Fork and

Ragged Falls were suggested by J. E. Haynes, Yellowstone photographic concessioner.

Both Mr. Gregg and J. E. Haynes made photographs of the principal attractions in this interesting Cascade Corner, while C. H. Birdseye, Chief Topographic Engineer of the U. S. Geological Survey with his assistant obtained data for a map showing their locations.

Ouzel Fall, 230 feet in height in an unnamed stream in the Cascade Corner is one of the highest in the entire park. **Cave Falls,** in the Falls River is 250 feet wide and 20 feet high. **Terraced Falls,** 65 feet high, is one of the most striking water falls in the region and is only eclipsed by **Union Falls** in Mountain Ash Creek.



OUZEL FALL, CASCADE CORNER 21095

A three day festival beginning in Lander, Wyoming, in August, 1921, terminated two days later at Two-Gwo-Tee Pass with impressive ceremonies to commemorate the opening of the southern automobile route to Yellowstone National Park.

An impressive ceremony was held at Two-Gwo-Tee Pass in which Horace M. Albright, park superintendent, the governors of several states, and several other prominent people participated. Chief Yellow Calf and Mrs. Yellow Calf were among the group of Indians present which, with their tepees and native attire, lent picturesqueness.

The principal natural attractions along the route are Crow-Heart Butte, the washed bluffs, Pinnacle Butte, Two-Gwo-Tee Pass, Jackson Lake, and the Teton Mountains. From Jackson Lake at Moran, Wyoming, it is but twenty-five miles by splendid road to the southern boundary of the park.

Emerson Hough, eminent writer, H. M. Albright, park superintendent, Wm. C. Gregg, representing the National Arts Club of New York, and J. E. Haynes, park photographer, visited Cooke City and the Grasshopper Glacier region in 1921.

They rode by auto to Cooke City. With saddle horses obtained at Shaw's Camp they spent the morning of the second day climbing the mountains toward the glacier. The last hour of the climb was made on foot through broken rock up a steep slope where horses could not be taken.

The glacier, named for the millions of grasshoppers embedded in its ice, is a solid sheet covering an area of approximately five square miles at the head of Rosebud Canyon on Glacier Peak. The party was enthusiastic and declared this trip well worth taking. The mountain scenery is stupendous and compares favorably with the Swiss Alps. The glacier in its rugged setting with its enormous depth and great expanse, presents a spectacle among the greatest in this country.

While Cooke City may be reached by trail from the Cody Road, it is recommended for those who motor, to make this trip as a side trip from Tower Junction on their trip around the park, as they can drive their cars to Cooke City and obtain horses there for the climb to the glacier.

The Yellowstone Park Transportation company, the Yellowstone Park Hotel company, the Yellowstone Park Camps company, Haynes Picture Shops, Hamilton Stores, Whittaker Stores and the Park Curio Shop have expanded and enlarged their plants and facilities; and many increases are now under way in anticipation of double and treble patronage, which, with the popularization of the Yellowstone, is foreseen.

PARK AUTOMOBILE STAGE 17056

The National Park Service has made extensive improvements in sanitation and the extension of public automobile camps, and completed three large ranger stations at Old Faithful, Yellowstone Lake and Grand Canyon. It has undertaken the survey for a new road between Ashton, Idaho, and Upper Geyser Basin in the park, through the scenic Cascade Corner—the Bechler River region—which until recently remained unexplored, but is known now to contain waterfalls and other scenic attractions of signal importance.

The entire 356 miles of park roads were maintained throughout the season in excellent condition. The program of surfacing, widening and straightening the highways in needed places was carried out. Turns and grades are well marked now for first-time drivers; and miles of sturdy parapets protect the places that in former days looked dangerous.

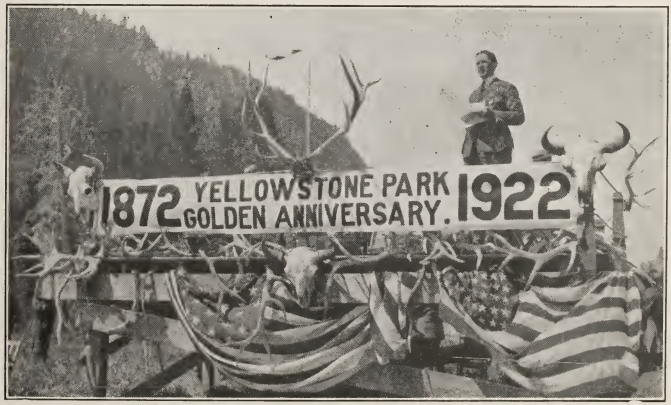
The Howard Eaton Trail around the park "loop" paralleling the road system was completed. "Slow" signs indicating all places where this horseback trail crosses the automobile highway have been placed for the motorists' guidance. This much needed trail affords equestrians ideal routes to all main points without conflict with the motor traffic. There are 781½ miles of trails in the park.

All automobile routes leading to the park have been improved during the past year. The Hoback Canyon route to the southern entrance from Rock Springs and Kemmerer was opened. The Federal Government is expending $100,000.00 in the improvement of the Gallatin road leading into the park at the western entrance. The Black and Yellow Trail across the Big Horns to Cody, the eastern entrance

EXPLORER C. W. COOK AND SUPT. H. M. ALBRIGHT 22234

route, is now finished; and the new highway through the Wind River Canyon has been started.

Ceremonies commemorating the Semi-Centennial year of the establishment of the park were held on July 14, 1922, at



SUPT. H. M. ALBRIGHT, CHIEF OF SEMI-CENTENNIAL CEREMONIES, JULY 14, 1922
22207

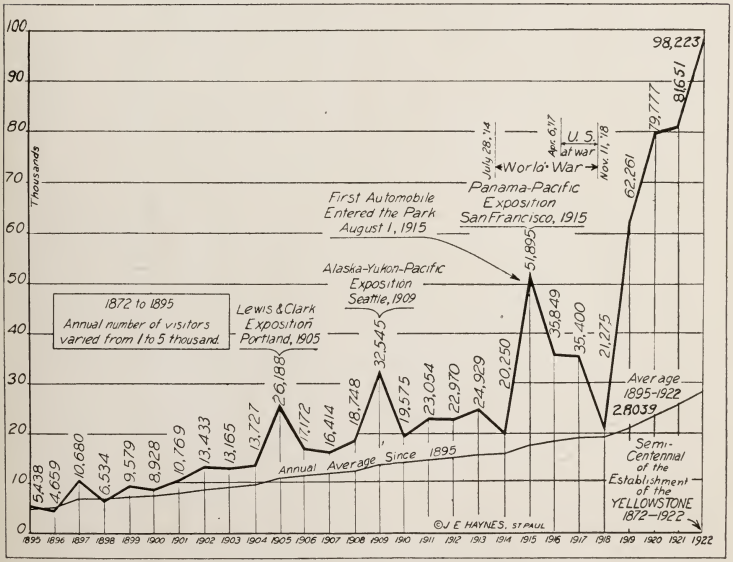
the foot of National Park Mountain near the junction of the Gibbon and Firehole rivers where in 1870, in the camp of the famous Washburn-Langford expedition, the "National Park Idea" was born. Mr. C. W. Cook of the Cook-Folsom expedition of 1869 attended in person. Mr. Cornelius Hedges, Jr., and W. A. Hedges planted an evergreen tree to mark the spot where their father stood in 1870 when he proposed making this unequaled region a national park. Public officials and prominent friends of the park were on the program. Superintendent Horace M. Albright made a short address recounting the historical development of the park, and read telegrams from President Warren G. Harding, Hon. Albert B. Fall, Secretary of the Interior, Hon. Stephen T. Mather, Director of the National Park Service, and other high officials.

The Semi-Centennial Geyser broke out on August 14, 1922, with a furious explosion and a shower of rocks, at a point north of Roaring Mountain adjacent to the highway The rush of boiling water washed out part of the road, killed trees over an area several hundred feet across, and menaced travel for several days. Its initial eruption was three hundred feet high. Later eruptions were less spectacular, and the intervals gradually increased until at the close of the season many people were of the opinion that it was dying out.

SEMI-CENTENNIAL GEYSER, AUG. 14, 1922 22626

J. E. Haynes, official photographer of the park, completed new shops at Grand Canyon and Tower Fall during 1922, and enlarged to twice its former capacity his photo-finishing plant at Mammoth Hot Springs. He opened up and operated a new shop in Old Faithful Inn, and will have one in the new Lake Hotel as soon as construction work is completed. In the Old Faithful and Grand Canyon Camps he established shops in the permanent buildings of the Yellowstone Park Camps company replacing former temporary locations. This completes the chain of twelve Haynes Picture Shops, one in each of the four hotels, four in the permanent camps, and four in outside locations.

The Haynes Travelgraph tells the story of the constantly increasing popularity of Yellowstone National Park. The season just past—the Semi-Centennial year of the establishment of this great park—with its travel record of 98,223 visitors, witnessed the making of a new high record despite the railway strike. Furthermore, the proportion of visitors who came by rail to those who came in their automobiles was maintained.



HAYNES TRAVELGRAPH OF YELLOWSTONE PARK 22398

YELLOWSTONE PARK TRAVEL.

(Previous travel varied from 1,000 to 5,000 annually).

Year	Persons	Year	Persons
1895	5,438	1909	32,545
1896	4,659	1910	19,575
1897	10,680	1911	23,054
1898	6,534	1912	22,970
1899	9,579	1913	24,929
1900	8,928	1914	20,250
1901	10,769	1915	51,895
1902	13,433	1916	35,849
1903	13,165	1917	35,400
1904	13,727	1918	21,275
1905	26,188	1919	62,261
1906	17,172	1920	79,777
1907	16,414	1921	81,651
1908	18,748	1922	98,223

YELLOWSTONE PARK SUPERINTENDENTS.

N. P. Langford.....May 10, 1872 to April 18, 1877
Philetus W. Norris.....April 18, 1877 to Feb. 2, 1882
Patrick H. Conger.....Feb. 2, 1882 to July 28, 1884
Robert E. Carpenter.....Aug. 4, 1884 to May 29, 1885
David W. Wear.....May 29, 1885 to Aug. 1, 1886

Army Officers Detailed as Acting Superintendents.

Capt. Moses Harris....5th Cav., Aug. 17, 1886 to May 31, 1889
Capt. F. A. Boutelle....1st Cav., June 1, 1889 to Feb. 14, 1891
Capt. Geo. S. Anderson, 6th Cav., Feb. 15, 1891 to June 22, 1897
Col. S. B. M. Young...3rd Cav., June 23, 1897 to Nov. 15, 1897
Capt. James B. Erwin..4th Cav., Nov. 16. 1897 to Mar. .., 1899
Capt. W. E. Wilder....4th Cav., Mar. .., 1899 to June 22, 1899
Capt. Oscar J. Brown..1st Cav., June 23, 1899 to July 23, 1900
Capt. Geo. W. Goode....1st Cav., July 24, 1900 to May 7, 1901
Capt. John Pitcher.....1st Cav., May 8, 1901 to May 13, 1907
Gen. S. B. M. Young....Retired, May 14, 1907 to Nov. 27, 1908
Maj. H. C. Benson....14th Cav., Nov. 28, 1908 to Sept. 29, 1910
Col. L. M. Brett.....1st Cav., Sept. 30, 1910 to Oct. 16, 1916

Assistant Superintendent Detailed as Acting Superintendent.

Chester A. Lindsley.....Oct. 16, 1916 to June 28, 1919

Appointed From Civil Life.

Horace M. Albright.....June 28, 1919

SECRETARIES OF THE INTERIOR.

Since the Act of Dedication of Yellowstone National Park, March 1, 1872.

NAME	From	Date of Commission	Administration
Hon. Columbus Delano.....	Ohio	Nov. 1, 1870	Pres. Grant.
Hon. Zachariah Chandler.....	Michigan	Oct. 19, 1875	Pres. Grant.
Hon. Carl Schurz.....	Missouri	Mar. 12, 1877	Pres. Hayes.
Hon. Samuel J. Kirkwood.....	Iowa	Mar. 5, 1881	Pres. Garfield and Arthur.
Hon. Henry M. Teller.....	Colorado	Apr. 6, 1882	Pres. Arthur.
Hon. Lucius Q. C. Lamar.....	Mississippi	Mar. 6, 1885	Pres. Cleveland.
Hon. William F. Vilas.....	Wisconsin	Jan. 16, 1888	Pres. Cleveland.
Hon. John W. Noble.....	Missouri	Mar. 6, 1889	Pres. Harrison.
Hon. Hoke Smith.....	Georgia	Mar. 6, 1893	Pres. Cleveland.
Hon. David R. Francis.....	Missouri	Sept. 1, 1896	Pres. Cleveland.
Hon. Cornelius N. Bliss.....	New York	Mar. 5, 1897	Pres. McKinley.
Hon. Ethan A. Hitchcock.....	Missouri	Dec. 21, 1898	Pres. McKinley & Roosevelt.
Hon. James R. Garfield.....	Ohio	Jan. 15, 1907	Pres. Roosevelt.
Hon. Richard A. Ballinger.....	Washington	Mar. 5, 1909	Pres. Taft.
Hon. Walter L. Fisher.....	Illinois	Mar. 13, 1911	Pres. Taft.
Hon. Franklin K. Lane.....	California	Mar. 5, 1913	Pres. Wilson.
Hon. John Barton Payne.....	Illinois	Mar. 15, 1920	Pres. Wilson.
Hon. Albert B. Fall.....	New Mexico	Mar. 4, 1921	Pres. Harding.
Hon. Hubert Work.....	Colorado	Mar. 5, 1923	Pres. Harding.

NATIONAL PARK SERVICE DIRECTORS.

NAME	From	Date of Commission	Administration
Stephen T. Mather.....	Chicago, Ill.	May 16, 1917	Pres. Wilson. Pres. Harding.

THE YELLOWSTONE PARK AND HOW IT WAS NAMED

The Devil was sitting in Hades one day,
In a very disconsolate sort of a way.
One could tell from his vigorous switching of tail,
His scratching his horn with the point of his nail,
That something had gone with His Majesty wrong,
The steam was so thick and the sulphur so strong.

He rose from his throne with a gleam in his eye,
And beckoning an agate-eyed imp standing by,
Commanded forthwith to be sent to him there
Old Charon, employed in collecting the fare
Of the wicked, who crossed the waters of Styx,
And found themselves soon in a deuce of a fix.

Old Charon, thus summoned, came soon to his chief.
As the Devil was angry, the confab was brief.
Says the Devil to Charon, "Now, what shall I do?
The world it grows worse and grows wickeder, too;
What with Portland, Chicago, Francisco, New York,
I get in my mortals too fast for my fork;
I haven't the room in these caverns below,
St. Peter, above, is rejecting them so.

So hie you, my Charon, to earth, far away.
Fly over the globe without any delay,
And find me a spot, quite secluded and drear,
Where I can drill holes from the center in here.
I must blast out more space; so survey the spot well,
For the project on hand is the enlargement of Hell.

But recollect one thing, Old Charon, when you
Can locate the district where I can bore through,
There must be conveniences scattered around
To carry on business when I'm above ground.
An 'ink-pot' must always be ready at hand
To write out the names of the parties I strand.

There must be a 'punch-bowl,' a 'frying pan,' too,
A 'cauldron' in which to concoct a 'ragout.'
An 'old faithful' sentinel showing my power
Must shoot a salute on the earth every hour,
And should any mortal by accident view
The spot you have chosen, why, this you must do:
Develop a series of pools, green and blue,
That while these poor earth bugs may beauties admire
They'll forget that below I'm poking the fire.

Now fly away, Charon, be quick as you can,
For my place here's so full that I can't roast a man."
To earth flew fleet Charon, to regions of ice;
He found these too cold—so away in a trice
He sought a location in Africa's sands,
He prospected, and finding too much on his hands
He cut out Australia, Siberia too,
The north part of China—no! they would not do;
'Till just as about to relinquish the chase
He stumbled upon a most singular place,
'Twas deep in the midst of a mountainous range,
Surrounded by valleys secluded and strange,
In a country the greatest, the grandest, the best
To be found upon earth—America's West.

Here the crust seemed quite thin, and the purified air,
With the chemicals hidden around everywhere,
Would soon make the lakes that the Devil desired;
So he flew to Chicago, and there to him wired:
"I've found you a place never looked at before;
You may heat up the rocks, turn on water, and bore."

Then the Devil with mortals kept plying the fire,
Extracting the water around from the mire,
And boring great holes with a terrible dust,
'Till soon quite a number appeared near the crust,
Then he turned on the steam—and lo! upward did fly,
Through rents in the surface, the rocks to the sky.

Then with a rumble there came from each spot,
Huge volumes of water remarkably hot,
That had been there in caverns since Lucifer fell—
Thus immensely enlarging the confines of Hell,
And it happens that now when Old Charon brings in
A remarkable load of original sin,
That His Majesty quietly rakes up the coals,
And up spouts the water, in jets, through the holes,
One may tell by the number of spurts when they come,
How many poor mortals the Devil takes home.

But Yankees can sometimes, without doing evil,
O'ermatch in sagacity even the Devil.
For not long ago Uncle Sam came that way
And said to himself, "Here's the Devil to pay.
Successful I've been in all previous wars;
Now Satan shall bow to the Stripes and the Stars.

This property's mine, and I hold it in fee;
And all of this earth shall its majesty see.
The deer and the elk unmolested shall roam,
The bear and the buffalo each have a home;
The eagle shall spring from her eyrie and soar
O'er crags in the canyons where cataracts roar;
The wild fowls shall circle the pools in their flight,
The geysers shall flash in the moonbeams at night,
Now I christen the country—let all nations hark!
I name it the Yellowstone National Park."

Wm. Tod Helmuth.

Grand Canyon, August, 1894.

YELLOWSTONE NATIONAL PARK LITERATURE

CHITTENDEN, HIRAM M., The Yellowstone National Park, Descriptive, Geological, Historical, Illustrated, 350 pages, Silk Cloth. The most comprehensive and absorbing book on the park ever published. (Postpaid) $2.75.

HOUGH, EMERSON, Maw's Vacation. A most interesting vacation story of Yellowstone—guaranteed to make any human being laugh. Mr. Hough is thoroughly familiar with the scenic and human aspects of the park, and has an uncanny insight, and a pleasing style, as you know. (Postpaid) $0.83.

HAYNES, J. E., Haynes Guide of Yellowstone National Park, Complete handbook and Motorists' guidebook and road log with maps of the park, and each district, 100 illustrations, Geology, Animals, History, Flowers and every feature described. 192 pages, colored poster cover. Approved by the National Park Service. (Postpaid) $0.83. De Luxe binding $1.60.

LANGFORD, NATHANIEL P., Discovery of Yellowstone Park, The Diary of the Washburn Expedition to the headwaters of the Yellowstone and Firehole rivers in 1870, 160 pages, Cloth, Illustrated. (Postpaid) $1.75.

THONE, DR. FRANK E. A., Trees and Flowers of Yellowstone National Park. Many illustrations from drawings and photographs. Approved by the National Park Service. Colored poster cover, $0.83; De Luxe binding, $1.60 (postpaid).

BREWER, CLARENCE A., Yellowstone in Jingletone. A Souvenir Booklet of clever verses, artistic poster cover, size 6x9 inches, 20 pages, profusely illustrated. (Postpaid) $0.41.

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The publisher offers this list with a feeling of pride. Any one of these books makes an acceptable present. All should be in every park enthusiast's collection for reference. (Mail orders solicited.)

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"Haynes Guide of Yellowstone National Park" (De Luxe)	1.60*
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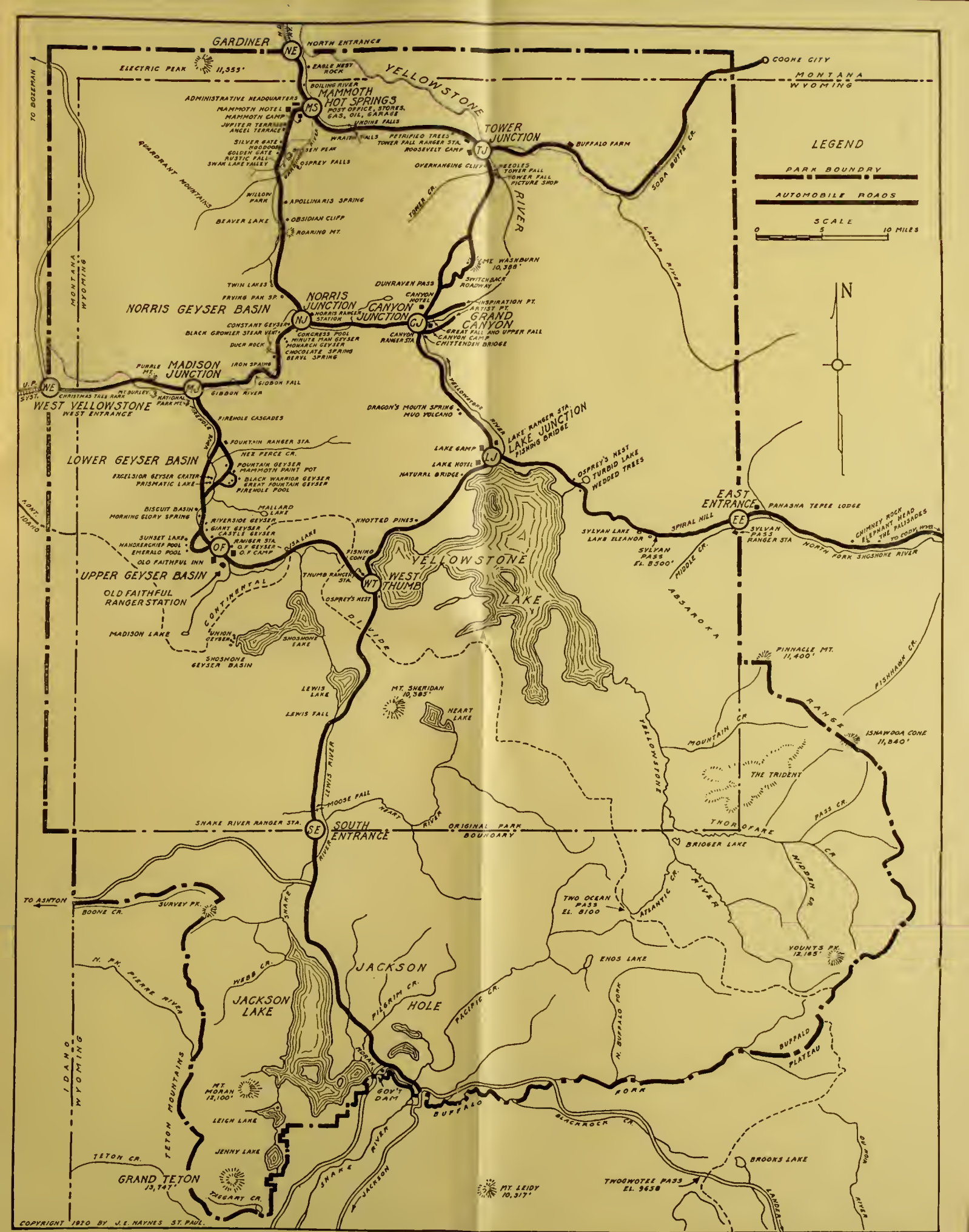

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SHOWING ORIGINAL BOUNDARIES AND PROPOSED ENLARGEMENT